To William H.
from his sincere friend,
J. H. Colen
Phil. Oct. 4th 1852

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# ILLUSTRATIONS

OF

# MEDICAL BOTANY:

CONSISTING OF

## COLOURED FIGURES OF THE PLANTS

AFFORDING THE IMPORTANT ARTICLES OF THE

# MATERIA MEDICA.

AND DESCRIPTIVE LETTERPRESS

BY JOSEPH CARSON, M.D.,

PROFESSOR OF MATERIA MEDICA IN THE PHILADELPHIA COLLEGE OF PHARMACY; MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA; FELLOW OF THE COLLEGE OF PHYSICIANS, ETC.

THE DRAWINGS ON STONE BY J. H. COLEN.

VOL. I.

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TO

# GEORGE B. WOOD, M. D.,

PROFESSOR OF MATERIA MEDICA IN THE UNIVERSITY

OF PENNSYLVANIA,

WHOSE EXTENDED LEARNING,

AND UNREMITTING LABOUR,

IN THE CULTIVATION OF THE DEPARTMENT OF

MATERIA MEDICA,

HAVE PLACED HIM AMONG THE MOST EMINENT

OF PHARMACOLOGISTS:

AS AN ACKNOWLEDGMENT

OF THE NUMEROUS ACTS OF KINDNESS,

WHICH FROM EARLY LIFE HAVE BEEN RECEIVED AT HIS HANDS,

THIS WORK

IS AFFECTIONATELY DEDICATED BY

THE AUTHOR.

# INTRODUCTION.

THE present work has been undertaken with the impression that it would prove acceptable to numerous Students, Physicians, and Pharmaceutists in the United States. Two excellent illustrated treatises devoted to the indigenous Materia Medica have been given to the public,* but none of a general character embracing exotic productions have been presented, and such as are of European origin are either so expensive or so little known as to be restricted for the most part to the libraries of institutions, or to those of individuals especially cultivating this branch of Medical Science.

Medical Botany has been neglected in this country, not on account of its destitution of interest, nor from the idea of its little importance, but because the facilities of readily prosecuting its study have not been supplied, more particularly in the way of delineation. The connexion between Materia Medica and Botany, is well understood; there is an indebtedness of the former to the latter, and a dependence, either for the means of distinguishing between articles or of augmenting their number, too well settled to be controverted. The Dispensatories and Treatises on the Materia Medica are filled with technically descriptive accounts of plants; in some of them even a botanical arrangement or classification has been adopted. As such minuteness of detail is met with in the books upon the subject, with respect to the sources of the vegetable substances, and as these details are essential to complete the history of them, it is hardly necessary to amplify upon the importance of understanding them. Where an inability so to do occurs, it must be a matter of regret to the individual, and cannot arise from any undervaluation of the subject. Under present circumstances this inability is too common. Preliminary knowledge can only be acquired from lectures or from books of an elementary character, and the principles having been once mastered, further difficulty is not experienced, as the key is in possession which unlocks the mysticism of the language in which the usual descriptions are couched.

Apart from the expediency of merely comprehending what is written in the books upon the department, the advantages and gratification experienced by one who has an insight into this scientific mode of description, exemplification, and arrangement will induce him further to pursue it. A wide field of research is opened, to be cultivated with infinite profit to himself, and should opportunity present, with benefit to science itself. Nature is spread open on all sides, and many an opportunity of contributing to the developement of truths much sought for and desired, has been lost from an inability to appropriate it.

Considerable changes have been made of late years in the modes of instruction. The existing age may be said to be one of illustration. The plan has at length been resorted to, of conveying information to the mind by impressing the senses, and demonstration has been substituted for long, bare, obscure description. To be successful, a lecturer must now have at his command, the means of presenting to his hearers the visible objects or representations of them, about which he discourses, and in the Schools of Medicine of high repute, much labour and expense have been incurred for the purpose. As regards the department of Materia Medica, the instruction usually given is accompanied by the exhibition of delineations of Medical Plants. This will answer the ends of the teacher and greatly aid the listener for the time

* The *American Medical Botany* of Dr. Bigelow, and *Vegetable Materia Medica* of the United States, by Dr. W. P. C. Barton.

being; but amidst the multiplicity of objects, and from the brief period allowed for inspection, the impression made upon the mind is soon enfeebled, and in most cases altogether fades, if close and more protracted observation be not afforded. It is then desirable to possess the means of reviving impressions received, of studying the subject at leisure, and of rendering the plants familiar.

But not only to students will the publication be serviceable; it will materially aid numerous teachers, whose facilities of access to the works from which the necessary materials for illustration can be derived, are few and imperfect, and in this respect a double end will be accomplished.

In the execution of the work a variety of materials has been employed. The design has been to furnish the most faithful sketches. This has been done by presenting such as are of known authority, derived from different illustrative works. Where such have been used, no one has been exclusively followed, but the best figures selected. The author is thus indebted for many of his drawings to the continuation of the Botanical Magazine, by Hooker, the Flore Medicale, the Plantes Grasses of De Candolle, the work of Nees von Esenbeck, that of Nectoux, the Plantes Equinoctiales of Humboldt and Bonpland, the Hortus Medicus of Graves and Morries, and Hayne's Medical Botany. Yet the labour which has devolved upon him has not been entirely that of compilation; in some respects a claim to originality may be set up. From the collection of specimens which during the last ten years, he has been enabled to make, and which have been employed by him in the Courses at the Philadelphia College of Pharmacy, many of the representations are entirely new, and where they are not strictly so, corrections have been made from this source, which render them more valuable than those which have been used as copy.

The accompanying text contains a succinct account of each plant, comprehending all the details necessary to understand its character and relations, in a scientific and medicinal point of view. The arrangement or classification is that of Jussieu as modified by De Candolle, for an exposition of which reference may be made to Pereira's Materia Medica, or the recent Manual of Dr. Royle. Those readers who are desirous of seeing the full extent of its application, may be further satisfied by the perusal of Richard's Histoire Naturelle Medicale, and Fee's Cours d'Histoire Naturelle Pharmaceutique. The Medical Botany of Dr. Lindley, and that of Dr. R. E. Griffith may also be consulted. This classification, irrespective of the developement of botanical affinities, has the merit of grouping plants allied to each other in medicinal qualities, and not only is this the case, but chemical examination of the proximate principles upon which the activity depends, frequently reveals similarity of composition. The study of plants in this light is most interesting. Affinities of the kind were suspected by the older botanists, and sketched by Linnæus. From this originated, no doubt, the plan pursued by Murray in his Apparatus Medicaminum, and of Woodville in his Medical Botany. The credit of unfolding the entire subject, however, was reserved for De Candolle, whose "Essay on the Medical Properties of Plants," is a masterpiece of research. It has afforded the model of subsequent Treatises. Late scientific, chemical, and therapeutic investigations have confirmed his principles.

As the design of the work is simply to present the botanical history of the Materia Medica, and not a complete account of it, with the exception of indicating the modes of operation peculiar to each substance, all therapeutical and pharmaceutical details appertaining to it have been omitted. The works especially written with the view of unfolding them are full, and of easy access.

# MEDICAL BOTANY.

## PHANEROGAMÆ.

Flowering Plants, or such as have distinct appreciable organs of reproduction. They are also called *Vasculares*, from the commingling of vessels, in their structure, with the cells, which latter existing alone in the Cryptogamæ or Flowerless Plants, are known as *Cellulares*. Vascular plants are provided with *stomata;* the cellular are destitute of them.

## DICOTYLEDONEÆ *vel* EXOGENÆ.

*Dicotyledonous* or *Exogenous* plants are such as have in their seeds two or more cotyledons or lobes, and grow by additions to their exterior. They are the most highly organized of all vegetable productions. The stems or trunks are composed of bark, woody fibre, and pith, deposited upon each other in the order named. The bark is composed of layers, becoming thicker by the deposition of new matter on the inner side. The wood is made up of concentric ligneous rings, traversed by medullary rays. Each ring is the deposit of one period of inflorescence, and taking place exteriorly, constitutes the *exogenous* growth. It is penetrated lengthwise by the canals which carry the ascending sap and descending fluids, and spiral vessels. These are most apparent in the sap-wood or alburnum, which constitutes the outer portion of the stem, while in the inner portion, the heart-wood or duramen, if the plant be large and long lived, they are obliterated. The leaves are reticulated in the arrangement of their veins, and are articulated with the stems. Cotyledons opposite if two; if more, verticillate. The radicle is naked.

The Dicotyledonous plants afford the largest number of medicinal substances, as well as the most important edible fruits.

## THALAMIFLORÆ.

### DE CANDOLLE.

Plants possessing a calyx and corolla. The petals are distinct from one another. Stamens *hypogynous*, or inserted below the pistil into the receptacle.

## RANUNCULACEÆ.

### JUSSIEU.

Characters.—*Flowers* usually complete, regular or irregular, solitary, racemose, or paniculate. *Calyx* composed of three to six sepals, sometimes petaloid, hypogynous, deciduous, generally imbricate in æstivation. *Petals* three to fifteen, indefinite in number, hypogynous, in one or more rows, distinct. *Stamens* definite or indefinite, hypogynous; *anthers* adnate, opening by a double cleft. *Carpels* numerous, seated on a torus, one-celled, or united into a single many-celled pistil; *ovary* one or many-seeded, the ovules adhering to the inner edge; *style* one to each ovary, short,

simple. *Fruit* either consisting of dry achenia, or baccate, with one or more seeds, or follicular with one or more valves. *Seeds* albuminous; when solitary, either erect or pendulous. *Embryo* minute, *albumen* corneous. The Ranunculaceæ are herbaceous plants or rarely shrubs. Their *leaves* are alternate or opposite, generally much divided, with the petiole dilated. *Stipules* occasionally present. *Hairs* simple.

Nearly all the plants belonging to this family contain a principle of activity. In some of them it is of great power, inducing violent irritation in the animal economy. In many it is volatile and fugitive, as in the species of Buttercup, or exists as a volatile oil, as in Hellebore; in others it has the properties of an alkaloid, as in Aconite. Where a simple bitter principle exists, as in Golden-thread, it is mild in operation. The division into sub-orders in a measure reconciles this difference in the active principles, and makes them harmonize with the botanical characters.

# HELLEBORUS NIGER.

## LINNÆUS.

## BLACK HELLEBORE.

SEX. SYST.—Polyandria, Polygynia.

GEN. CHAR.—*Calyx* persistent, of five sepals, roundish, obtuse, large, usually green. *Petals* eight to ten, very short, tubular, narrow, and nectariferous beneath. *Stamens* thirty to sixty-four. *Ovaries* three to ten. *Stigmas* terminal, orbicular. *Capsules* coriaceous. *Seeds* in a double row, elliptical, umbilicated. *De Candolle.*

SPECIF. CHAR.—*Root* (rhizoma) perennial, knotted, and fibrous, black externally, white internally. *Leaves* pedate, of a deep green colour, radical on long footstalks. The lobes or leaflets are five or more in number, one central; they are ovate lance-shaped, smooth, shining, coriaceous and serrated in their upper portion. *Peduncles* radiate, five or six inches high, round, tapering, reddish at the base, supporting one or two large flowers, with floral leaves. *Sepals* five, large, roundish, concave, spreading, white or pale rose-colour at first, green subsequently.

The *Black Hellebore* is an inhabitant of the mountainous districts of Southern Europe. It is found in Switzerland, France, Spain, and Italy. In consequence of flowering in the middle of winter, and being used as a decoration at the feast of Christmas, it has been called the *Christmas Rose.* The root, which is the part used in medicine, is a drastic cathartic, and is used in cases of mania. In smaller doses it is emmenagogue. A volatile oil, with resinous and bitter principles exist in it, which undoubtedly are the active principles.

The medicine, in the older works on Materia Medica, was known by the name *Melampodium*, so called in honour of Melampus, who, as fable states, cured the daughters of Prætus, King of Argos, of melancholy, by administering goat's milk imbued with its virtues.

The *H. officinalis* of *Dr. Sibthorp*, found by him in Greece, is the *H. niger orientalis* of *Tournefort*, and *H. orientalis* of *De Candolle.* It has been thought to be the Hellebore of Dioscorides. The roots are not exported.

PLATE I.—*The plant in flower, nectariferous petal and capsules.*

# ACONITUM NAPELLUS.

## LINNÆUS.

## WOLFSBANE, MONKSHOOD.

SEX. SYST.—Polyandria, Trigynia.

GEN. CHAR.—*Calyx* petaloid, irregular, deciduous, or withering; upper sepal concave, helmet-shaped. *Petals* two, superior; nectaries on long stalks, expanded at the apex into a bag hidden beneath the helmet. *De Candolle.*

SPECIF. CHAR.—*Flowers* densely spiked, or loosely panicled. Helmet semicircular, rarely boat-shaped. Bag of the petals somewhat conical. Spur short, thick, inclined. Wings of the stamens cuspidate or evanescent. Lobes of the leaves cuneate, pinnatisect. *Ovaries* three, rarely five, smooth or pilose. *De Candolle.*

HELLEBORUS NIGER.

ACONITUM NAPELLUS.

CIMICIFUGA RACEMOSA.

This species of Aconite is a perennial herb, with simple stems and a tapering root. Pereira states that "this species is subject to great variation, in the dense or loose condition of the inflorescence, in the form of the helmet, the colour and size of the flower, the breadth and the number of slashes of the leaves, the downiness of the parts of the plant, and the condition of the stem."

The Aconite or Monkshood is found in Greece, Italy, and the mountainous pastures and cold hills of many parts of Europe, but is a doubtful native of Europe. (*Royle.*) It has been introduced into the gardens of the United States.

By De Candolle twenty-nine varieties are admitted. In the variety figured, the flowers are deep blue, and the leaves divided into five segments, which are lobe-like and shortly acute. The stem is about two feet high. The roots of the Aconite are of a tapering form, of a dark colour externally, white internally. They are like the black radish, for which they have been mistaken; hence the specific name. All parts of the plant have a bitter taste, succeeded by a peculiar tingling sensation and numbness in the mouth.

Dr. Fleming (*An Inquiry into the Physiological and Medicinal Properties of Aconitum Napellus*, 1844) states that its properties do not suffer change by cultivation, and in all probability are as little influenced by climate. According to his observations, the tuber is most active, next the seeds, and successively the leaves, stalks, and fruit. The tuber is more active immediately after the period of flowering, as it has then attained its largest size. The activity of the leaves continues from their first appearance till the seeds begin to form, after which it quickly diminishes, though the leaves are still enlarging. The principles contained in aconite, are: 1. *Aconitina;* 2. Volatile acrid principle, not isolated; 3. Aconitic acid; 4. Fatty oil. The aconitina is an *alkaloid substance;* it was discovered by Brandes. The benumbing sedative effects of aconite have caused its employment in medicine; hence it has been used in neuralgia, rheumatism, and painful nervous affections. In over-doses its use is dangerous and has proved fatal. For the physiological effects, Dr. Fleming's recent work may be studied with advantage, as he has divided them into degrees, each of which is well defined.

As *aconitina*, the active principle, is an alkaloid, an alcoholic menstruum is best adapted for employment.

PLATE II.—*Represents the plant in flower and the capsule.*

# CIMICIFUGA RACEMOSA.

## NUTTALL.

## BLACK SNAKEROOT.

SEX. SYST.—Polyandria, Monogynia.

GEN. CHAR.—*Sepals* four to five. *Petals* (staminodia) three to five, concave or unguiculate, sometimes by abortion, few or none. *Stamens* numerous; *anthers* retrorse; *style* short; *stigma* simple. *Carpels* one to eight, follicular, many-seeded. Perennial *herbs*. *Leaves* two to three, ternately divided; *segments* incisely serrate. *Flowers* in virgate racemes, white. (Torrey and Gray, *Flor. of North America.*)

SPECIF. CHAR.—*Racemes* very long; *leaflets* ovate-oblong, incisely toothed; *staminodia* slender, two-forked. (Elliot, *Sketch* 2*d*, 16.) *Root* thick and knotted, with long fibres. *Stem* three to eight feet high, glabrous, furrowed, leafy near the middle. *Leaves* ternate; *leaflets* two to three inches long. *Racemes* branching, six to twelve inches long; *pedicels* three to four inches in length, bracteate. *Flowers* very fetid. *Sepals* caducous, greenish-white, concave. *Staminodia* four to eight. *Carpels* globose, ovate, glabrous. *Seeds* seven to eight, compressed and angular. De Candolle states that the flowers are sometimes digynous, but we have never observed more than a single ovary in a flower. (T. & G. *op. cit.* vol. i. p. 36.)

This plant is known by the names of *Tall Snakeroot, Black Snakeroot*, and *Rich Weed*. From its size, and the long white racemes of flowers, it is a distinguished ornament of our woods.

It is abundant in open woods and on hill sides throughout the United States, from Canada to Florida. It flowers in June and July.

The root, which is the portion employed in medicine, is composed of a rough tuberculated head, and numerous radicles, several inches long, of a black colour externally, white internally. It has a disagreeable odour, and a bitter astringent taste, with an impression of acrimony upon the palate. The sensible properties depend upon the time when

the root is collected; and in the dried state, upon the manner of drying and preserving it. It should be collected late in the summer or in the autumn.

According to the analysis made by Mr. Tilghman (*Amer. Journ. of Pharmacy*, vol. vi. p. 20), it contains fatty matter, resin, tannin, gallic acid, wax, gum, starch, sugar, oil, colouring matter, &c. The experiments led to no decided conclusion as to the nature of the active principle. "The peculiar bitterness and nauseating properties of the plant seemed more fully developed in the ethereal extract, than in any other form."

A variety of opinions have existed, with respect to the medical properties of the Black Snakeroot. Dr. B. S. Barton regarded it as an astringent; Dr. Mears and Garden as a narcotic; and Dr. Chapman as an expectorant and antispasmodic. Still later, it has been proposed by Dr. Young as a remedy in chorea; his ideas of its therapeutic value in this disease, have been confirmed by Dr. Wood. (See *U. S. Dispensatory*, and Am. edition of Pereira's *Mat. Med.*) It is given in substance, in tincture, and decoction.

PLATE III.—*Represents the plant in flower, an enlarged flower and petal.*

# COPTIS TRIFOLIA.

## SALSBURY.

## GOLDEN THREAD.

GEN. CHAR.—*Sepals* five to six, petaloid, deciduous. *Petals* five to six. *Stamens* fifteen to twenty-five. *Follicles* five to ten, on long stipes, somewhat stellately diverging, membranaceous, ovate-oblong, pointed with the style, four to eight seeded. *Herbs* with radical, divided, subcoriaceous leaves, and very slender, extensively-creeping roots.

SPECIF. CHAR.—*Leaves* three-foliate; *leaflets* cuneiform, obovate, crenately and mucronately toothed, obscurely three-lobed; *scape* one-flowered. *Roots* consisting of long, bright, yellow fibres, intensely bitter. *Leaves* evergreen; *leaflets* about an inch long. *Scape* slender, three to five inches high. *Sepals* five to seven, oblong, obtuse, white. *Petals* much shorter than the sepals, yellow at base. *Carpels* acuminated with the persistent style. *Seeds* oblong, black, and shining; *raphe* very indistinct. (Torrey and Gray, *Flor. of North America.*)

The Golden Thread is found in mountain bogs, from Greenland and Labrador to Pennsylvania. The root is filamentous, threadlike, and of a deep golden-yellow colour, very bitter. It is prepared by the Shakers, at Lebanon, in New York, who dry it and compress it into packages of a square form. There is no odour to it, but the taste is bitter.

This article of the Materia Medica is ranked among the pure bitters; the medicinal activity appears to depend upon a bitter extractive matter. It is used as a tonic, and ranks with gentian, quassia, and the pure bitters.

PLATE IV.—*Represents the plant in flower and fruit.*

# MAGNOLIACEÆ.

ESSENTIAL CHAR.—All parts of the flower disposed in a ternary number. *Sepals* three to six, deciduous. *Petals* three to twenty-seven, in many series, hypogynous. *Stamens* numerous, free, inserted on the torus, beneath the ovaries; *anthers* adnate, elongated. *Ovaries* numerous, inserted on the torus above the stamens, generally disposed like a spike, monostylous. *Styles* short; *stigmas* simple. *Carpels* as many as the ovaries, one-celled, one or many-seeded: capsular, and dehiscing by a superior chink; or capsular and bivalved, dehiscing by an inferior chink; or follicular; or somewhat fleshy and indehiscent; or finally, samariform, aggregate, or partially united into a loose or dense strobile. *Seeds* attached to the internal angle of the carpels; *albumen* fleshy; *embryo* straight, small, inferior. Elegant trees or shrubs. *Leaves* alternate, pinnatinerved. *Flowers* conspicuous, often powerfully odoriferous. (De Candolle, *Prodromus.*)

The predominating principle in this family is an essential oil; the flowers, fruit, and in many cases the bark, are impregnated with it. In the bark, it is frequently associated with a bitter principle and tannin. In one of the species of Magnolia, a peculiar crystalline principle has been discovered by Dr. S. Procter, which exists in other plants of the

COPTIS TRIFOLIA.

DRYMYS WINTERI.

family, and probably more extensively than has been discovered. When used medicinally they are stimulants and tonics. The different genera constituting the order, are scattered over the world, being found in North and South America, China, Japan, New Holland, and New Zealand (*Royle*). They are conspicuous for the beauty of their flowers, and the fragrance, which is so decided, as in some instances to act deleteriously.

# DRIMYS WINTERI.

## FOSTER. DE CANDOLLE.

## WINTER'S BARK TREE.

SEX. SYST.—Polyandria, Polygynia.

GEN. CHAR.—*Carpels* congested, baccate, many-seeded. *Filaments* thickest at the apex; *cells* of the anthers separate. *De Candolle.*

ESSENTIAL CHAR.—*Calyx* splitting unequally. *Petals* numerous. *Stamens* club-shaped, with terminal two-lobed anthers. *Style* none. *Berries* superior, aggregate. *Seeds* several, in a double row.

SPECIF. CHAR.—*Leaves* oblong, obtuse, glaucous beneath. *Peduncles* simple, approximated, or very short, divided into elongated pedicels. (De Candolle, *Prodromus.*)

Winter's Bark was brought before the medical profession in a paper read to the Medical Society of London, in 1779, by Dr. John Fothergill. It is contained in the fifth volume of "Medical Observations and Inquiries." In this paper is a history of the discovery of the tree, with a botanical account of it drawn up by the celebrated Dr. Solander. It appears that the tree and the bark were unknown, until the return of Captain John Winter, from a voyage to the South Seas, in 1579. Captain Winter was the commander of the ship Elizabeth, which sailed with Sir Francis Drake, in 1577; but after having passed through the Straits of Magellan, on the 8th of October, of the following year, was obliged, by stress of weather, to return to the Straits, and remaining there some time, procured the bark, which Clusius, in honour of him, named *Cortex Winteranus.*

Other navigators, upon visiting the Straits, noticed the tree, but nothing definite was known of its botany until in 1691, a Mr. George Handasyd, upon his return, presented some specimens to Sir Hans Sloane, who gave a description and figure in the Philosophical Transactions. But it appears that the flowers and fruit were wanting, and a systematic location was impossible; until in 1768, Captain Wallis, of the Dolphin, brought some perfect specimens, which came into the hands of Dr. Solander, who, from these, and his observations when staying at Terra del Fuego, drew up his description.

"*Winter's Bark Tree, Winterana Aromatica*, is one of the largest forest trees upon Terra del Fuego; it often rises to the height of fifty feet. Its outward bark is on the trunk gray, and very little wrinkled, on the branches quite smooth and green.

"The branches do not spread horizontally, but bend upwards, and form an elegant head of an oval shape.

"The leaves come out without order, of an oval, elliptic shape, quite entire, obtuse, flat, smooth, shining, of a thick, leathery substance, evergreen; on the upper side, of a lively deep-green colour, and of a pale bluish colour underneath, without any nerves, and their veins scarcely visible; they are sometimes narrower near the footstalks, and there their margins are bent downwards.

"In general the leaves are from three to four inches long, and between one and two broad; they have very short footstalks, seldom half an inch long, which are smooth, concave on the upper side, and convex underneath. From the scars of the old footstalks the branches are often tuberculated.

"The peduncles, or footstalks for the flowers, come out of the axillæ foliorum, near the extremity of the branches; they are flat, of a pale colour, twice or three times shorter than the leaves, now and then support only one flower, but are oftener near the top divided into three short branches, each with one flower.

"The *bracteæ* are oblong, pointed, concave, entire, thick, whitish, and situated at the basis of each peduncle.

"*Calyx* or *flower-cup*, it has none, but in its place the flower is surrounded with a *spathaceous* germ, of a thick leathery substance, green, but reddish on the side which has faced the sun; before this germ bursts, it is of a round

form, and its size is that of a small pea. It bursts commonly so that one side is higher than the other, and the segments are pointed.

"The *corolla* consists always of seven petals, which are oval, obtuse, concave, erect, white, have small veins, and are of an unequal size, the largest scarcely four lines long; they very soon fade, and drop off almost as soon as the germ bursts.

"The *filaments* are from fifteen to thirty, and are placed on the flat end side of the receptacle; they are much shorter than the petals, and gradually decrease in length towards the sides.

"The *antheræ* are large, oval, longitudinally divided into two, or as if each was made up of two oblong *antheras*.

"The *germina* are from three to six, placed above the receptacle, turbinated, or of the shape of an inverted fig, flat on the inside, and somewhat higher than the stamina; they have no styles, but terminate in a stigma, which is divided into two or three small lobes."

The fruit was not seen by Dr. Solander in a ripe state, but in the immature condition, is described as constituted of germs of a thick fleshy substance, becoming unilocular seed-vessels, and containing the rudiments of seeds, as in the generic account.

Captain Wallis stated that the trees are of various sizes, according to the soil they grow upon, and their situation. Those near the sea and in rocky ground were scrubby, the bark sticking close to the wood, and having a dirty look; those on the plain ground, and sheltered, were straight and tall, rising to thirty or forty feet, and as thick as a middle-sized man. The bark is smooth, and somewhat resembling the horse chestnut. In the neighbourhood of Port Famine it is abundant. It flowers in March, which is the commencement of the fall.

The bark attracted the attention of navigators from its warm, spicy, aromatic properties, and in the treatment of scorbutic disease, which broke out in vessels going into the Straits of Magellan, was a valuable auxiliary. It is rarely brought into the market as a drug, but is sometimes confounded with the Canella alba, from which it differs in colour, as it is pale yellowish or dull reddish-gray, with elliptical dull brown spots externally, and brown internally. It has an aromatic odour, and a warm bitterish taste.

It contains resin, volatile oil, and tannin, which last serves likewise to distinguish between it and Canella, as the chemical evidences are present in one case and not in the other.

The medical properties of it are those of an aromatic and tonic. From its sensible properties it was confounded with Canella alba. The medical uses are the same.

Some confusion is apparent among the authors who have treated of the tree, with respect to its name; hence the different appellations by which it has been described. The term *Winterana Aromatica* was bestowed by Linnæus, in commemoration of its discoverer; in so doing, however, he mistook it for the Canella Alba, and gave the account of the fructification of that plant. Browne, however, had stamped that genus with the name of Canella. Foster having obtained the parts of fructification, gave to the plant the name of *Drimys Winteri*, from its hot and pungent flavour. Murray, in his *Linn. Syst. Veg.*, gave the generic name *Wintera*, which he preferred to the original Linnæan one, and finally De Candolle has adopted the name of Foster, in imitation of Lamarck.

By Lamarck a species has been made which he calls *D. punctata*, but which by De Candolle is regarded as a variety.

PLATE V.—*Represents the plant in flower.*

# DRIMYS CHILENSIS.

## DE CANDOLLE.

## THE WINTER'S BARK OF CHILI.

SPECIF. CHAR.—*Leaves* oblong, obovate, glaucous beneath; *peduncles* crowded, one-flowered, or arising from a common peduncle; *petals* six to nine, oblong sub-obtuse. *Berries* oval, subcompressed, obtuse. *De Candolle. Prodrom.*, vol. i. p. 78.

This *Shrub* appears to be common in the marshes of Chili, whence M. Dombey procured specimens. It was separated and made into a new species by De Candolle, from the specimens examined by him in the Museum of Paris.

DRYMYS CHILENSIS.

COCCULUS PALMATUS.

Similar specimens were sent to this country by Dr. Styles of Valparaiso, in 1836, some of which were deposited by me in the Herbarium of the Academy of Natural Sciences of Philadelphia. The leaves correspond to the description given by De Candolle; they are three or four inches long and one wide. The flowers are axillary or terminal, from three to five together, in umbellated panicles, which are an inch and a half or two inches long. The calyx in three distinct ovate sepals; the corolla somewhat stellate in form, and constituted of at least twelve oblong, ovate, unequally sized petals. The germs are five in number, around which the shorter stamina are inserted on the receptacle.

The difference between this and the preceding species, consists in the character of the leaves, the calyx, and the number and form of the petals. The flowers, instead of being simple, are clustered.

The bark of this plant has the same aromatic and tonic virtues as the Winter's Bark, and is used for similar purposes.

Merat and De Lens state, that the specimen of D. Winteri which is in their possession came from Chili, and was sent by Dr. Bertero. Was it not the present plant? As no description is given, this question can only be answered conjecturally.

*D. Magnoliæfolia*, the bark of which is called Canelo, in Chili, is the same species.

PLATE VI.—*Represents the plant in flower. The inflorescence and fruit, are those of the D. granatensis.*

# MENISPERMACEÆ.

## DE CANDOLLE.

## MOONWORTS.

MENISPERMEÆ.—*Jussieu.*

ESSENTIAL CHAR.—*Flowers* (by abortion) unisexual, usually dicœcious, very small. *Floral integuments* in one or several rows, each consisting of three or four parts; hypogynous, deciduous. *Petals* sometimes absent. *Males: stamens* monadelphous, or rarely distinct; sometimes equal in number, and opposite to the petals; at other times three or four times as many; *anthers* adnate, turned outwards, or inserted on the apex of the filaments. *Females: ovaries* sometimes numerous, each with one style, cohering slightly at the base; sometimes solitary, crowned with many stigmas; internally many-celled, and therefore consisting of many carpels united together. *Drupes* usually berried, one-seeded, oblique, or lunate, compressed. *Seed* of the same form as the fruit; *embryo* curved, or turned in the direction of the circumference; *albumen* none, or small and fleshy; *cotyledons* flat, sometimes lying face to face, sometimes distant from each other, and lying in two cells of the seed; *radicle* superior, but sometimes appears inferior, when the apex of the fruit is, by the mode of growth, contiguous with the base. (*De Candolle*, and *Pereira's Mat. Med.*)

The plants belonging to this family are sarmentose shrubs, ligneous in their structure, but destitute of zones. Their leaves are alternate, often peltate, petiolate, and without stipules. The flowers are axillary. The common principle secreted by these plants is bitter; it is found in the roots and stems, with mucilage or an abundance of starch. The seeds of some of them are poisonous. In the Cocculus indicus the principle has been determined to be a peculiar one, to which the name *picrotoxine* has been given. This may, perhaps, be also found in the seeds of other individuals belonging to the family.

# COCCULUS PALMATUS.

## DE CANDOLLE.

## COLOMBA PLANT.

SEX. SYST.—Dicœcia, Hexandria.

GEN. CHAR.—*Flowers* unisexual, dicœcious. *Calyx* of twelve sepals, in four series, with two, three, or more close-pressed bracteoles. *Males: stamens* six, or rarely three, opposite to the inner sepals, distinct; *anthers* two-celled, ter-

minal, dehiscing vertically; *filaments* either filiform, with the anther-cells horizontal, approximate, and each externally two-lobed; or thickened at the apex, with the cells divaricating downwards, and separated by the connective. *Females*: *ovaries* three, six, or numerous. *Drupes* one to six, or numerous, one-celled, one-seeded. *Peduncles* axillary, or rarely lateral; *males* usually many-flowered; *females* generally few-flowered, without bracts, or with very small ones if present. (*Lindley.*)

Specif. Char.—The Colomba Plant has a perennial *root*, with spindle-shaped fleshy tubers, filled with longitudinal fibres; externally they are brown, with a warty epidermis, internally deep-yellow. The *stems* are annual, herbaceous and twining; of the males, simple; of the females, branched. *Leaves* alternate, nearly orbicular, cordate at the base, wavy on the margin, divided into five to seven lobes; entire, acuminate. *Racemes* axillary; in the male plants, compound. *Flowers* small, green. *Calyx* of six sepals, in two series, with bracteoles. *Petals* six, obovate, half enclosing the opposite stamens. *Anthers* terminal, two-celled, dehiscing vertically. *Ovaries* three, united at the base. *Drupes* or berries about the size of a hazel-nut, densely clothed with long spreading hairs, tipped with a black oblong gland. The whole plant is hairy and rough from this cause.

This plant is a native of the Mozambique Coast of Africa. Cibo is mentioned as a locality of it. It there grows spontaneously, and is not cultivated by the natives. The manner of preparing the root is to remove it from the earth during the dry season, which is in March, and after washing it, to cut it into sections, usually horizontal, and then dry them in the shade. The offsets are selected in preference. The pieces are marked by a thick ring on the outside, corresponding to the denser cortical substance, contrasting with the contracted interior, which is formed of more spongy parenchyma. The surface is marked by concentric rings.

The commercial root is easily powdered, and is possessed of some odour and a bitter mucilaginous taste. In the large pieces holes are present, which answered the purpose of stringing them to dry.

Colomba is brought into the market in bales, and as it constitutes an article of traffic in the East, it may be bought in most of the great marts of that portion of the world. Usually Bombay, Madras, or Calcutta, are the indirect sources of it.

It has been examined by Planche, and Wittstock. Among the principles, were found in it an *odorous principle*, volatile oil? a *bitter principle*, crystallizable, odourless, bitter and neutral (*Colombin*), and *starch* in large quantity.

Redi, in 1677, first mentioned the properties of the root of the Colomba. It was not, however, introduced into Europe for a long time after, and then little was known of its origin. Commerson, in 1770, procured some specimens from the garden of Mr. Poivre, of the Isle of France, and sent them to Europe. From these Lamarck has given his description of the plant, under the name of *Menispermum palmatum*. Mr. Fortin, a resident of Madras, obtained a living specimen of the plant in 1805; and Mr. Berry, in the *Asiatic Researches*, figured and described it. In 1830, Sir William J. Hooker published a complete description, both of the male and female plants, in the *Botanic Magazine*, from which our representation has been derived. This was made from the drawings sent to England by Mr. Telfair, of Mauritius, who obtained living roots from Captain Owen, procured by him when on the survey of the Eastern Coast of Africa. From the name Colombo Root it was supposed to be the product of Ceylon, but this is not the case as has been stated by Shurnberg and Dr. Raguet. The name by which it is known in India is *Kalumb*. For the first account of its medical properties we are indebted to Dr. Percival, in 1773.

The medical properties are those of a tonic, assisting and promoting digestion, without any stimulating action. It is given in powder, or in infusion or tincture. When boiled in water the starch is dissolved, and a turbid thick solution is produced; a decoction is therefore objectionable.

Plate IX.—*Represents the plant in flower, and the inflorescence and fruit.*

CISSAMPELOS PAREIRA.

# CISSAMPELOS PAREIRA.

## LINNÆUS.

## VELVET LEAF.

Pareira Brava.

Sex. Syst.—Dicœcia, Monadelphia.

Gen. Char.—*Diœcious. Male: sepals* four, in a double series. *Petals* four, united into a cup-shaped corolla, with an entire margin. *Stamens* united into slender columns, dilated at the apex, bearing two two-celled anthers, opening horizontally; *cells* placed end to end, and forming a four-lobed, four-celled annulus round the top of the column. *Female: calyx* of one lateral sepal. *Corolla* of one petal in front of the sepal. *Ovary* solitary. *Stigmas* three. *Drupe* obliquely reniform, but compressed, wrinkled round its margin. *Seed* solitary, uncinate; *embryo* long, terete, enclosed in a fleshy albumen. (Wight and Arnott, in *Pereira's Mat. Med.*)

Specif. Char.—Twining, filiform, branched, terete, spirally striate, villous. *Leaves* alternate, petiolate, suborbiculate; varying from obtusely-ovate to reniform, subcordate, rounded, or emarginate at the apex, mucronate; when young, pubescent above, and albido-villous beneath; when old, glabrous above, and pubescent beneath; nerved, reticulate, venose; *petioles* shorter than the leaf, terete, subtomentose. *Male: sepals* four, obovate, spathulate, obtuse, concave; externally hairy. *Nectary* concave, orbiculate, entire. *Filament* one, in the centre of the nectary; *crest* very short; *anthers* five, united in a capitate body, excavated in the centre, opening externally along the margin by four horizontal slits. *Female: racemes* at the ends of the branches, or axillary, longer than the leaves; *bracteas* leafy, gradually diminishing in size to the end of the raceme, shortly petiolate, suborbiculate, aristate, mucronate, pubescent, with about five minute shortly-pedicelled flowers within each. *Sepal* solitary, unilateral, spathulate, hirsute. *Petal* solitary, placed before, and but half the length of the sepal; truncated, hypogynous. *Ovary* ovate, villous; *stigmata* three. *Berry* globose, slightly compressed, of an orange-red colour, hispidulous. (Macfadyen, *Flora of Jamaica.*)

The root, which is the part used in medicine, is frequently of large size. It occurs in commerce in pieces varying from a few inches in length to a foot or more, of various thickness, tortuous, more or less cylindrical, of a dark-brown colour, furrowed longitudinally. The surface of a transverse section is of a yellowish-gray colour, presenting annular rings, traversed by radiating lines. It has no odour, and the taste is sweet, somewhat aromatic and then bitter.

This plant is a native of South America and the West India Islands. It was first made known by Marcgraf and Piso, in 1648, who met with it in Brazil. The name given by them for the root is *Caapeba*. In 1688, it was sent to Paris by M. Amelot, the French Ambassador at Portugal. Some difference of opinion exists with regard to the species or varieties affording Pareira Root. Linnæus made two species of the plant, founded upon the characters of the leaf. 1. *C. Pareira*, with petioles one to two inches long, villous, cylindrical, with a remarkable curvature at bottom, inserted in many individuals into the leaves at a small distance from the base, so as to make them appear peltate or orbicular. 2. *C. caapeba*, with petioles inserted into the lower edge directly. Poiret, by close examination, united them. According to Merat and De Lens, some other species, regarded as distinct, may be merged in it as varieties. The East India species may be different. *Caapeba* is the name which the root bears in South America. It is called usually *Pareira brava.*

Analyzed by Feneulle (*Journ. de Pharm.*), it was found to contain a soft resin, *yellow bitter principle*, brown colouring principle, vegeto-animal matter, fecula, supermalate of lime, nitrate of potash, and some ammoniacal and mineral salts. Wiggers, in 1838, announced the discovery of a new vegetable alkali? which he called Cissampeline. The yellow bitter matter is supposed to be the active principle.

The medical properties are those of a tonic and diuretic. It has been employed with some advantage in affections of the urino-genital organs. In chronic inflammation of the bladder, the testimony of Sir B. Brodie is strongly in its

favour. As a solvent for stone at one time it was supposed to possess efficacy. The Germans call it *Gries wurzel*, gravel root, but like others, supposed to possess similar powers, it has been misrepresented.

It is usually given in infusion or extract.

PLATE VIII.—*Represents the plant in flower, and the inflorescence enlarged, with the fruit.*

# PAPAVERACEÆ.

## JUSSIEU.

ESSENTIAL CHAR.—*Sepals* two, deciduous. *Petals* hypogynous, either four or multiples of that number, placed in a cruciate form. *Stamens* hypogynous, either eight, or some multiple of four; generally very numerous, often in four parcels, one of which adheres to the base of each petal; *anthers* two-celled, innate. *Ovary* solitary; *style* short or none; *stigmas* alternate with the placentæ, two or many; in the latter case, stellate upon the flat apex of the ovary. *Fruit* one-celled, either pod-shaped, with two parietal placentæ, or capsular, with several placentæ. *Seeds* numerous; *albumen* between fleshy and oily; *embryo* minute; straight at the base of the albumen, with plano-convex cotyledons. (*Lindley.*)

The Papaveraceæ are annual plants, rarely perennial or shrubby. Their roots are fibrous; leaves alternate, simple, pinnatinerved, dentate, or pinnately-lobed; the peduncle is one-flowered; the flowers are white, yellow, or red, never blue. A peculiar juice exists in them, which is either lactaceous, yellowish, or red.

The medical properties of this tribe of plants are acrid and narcotic; the acridity is evident from the taste and effects upon the mouth. The Poppy, (Papaver,) is taken as the type of the tribe. The properties, however, do not reside in the same parts of the plants composing it. Some are found to contain them solely in the fruit, as is the case with the Opium Poppy. Others in the root or stems, as in Sanguinaria canadensis. In the former, to other acrid principles is joined, a decided soporific principle, Morphia, upon which the peculiar value of the product, Opium, depends. The acrid and narcotic effects of the whole tribe is so marked, that when studying the individuals in their relations, botanical and other, this relation cannot be overlooked. The idea of Fée is worthy of note, that if we abstract Morphia from the Poppy, which gives a decided soporific preponderance, the mode of action is similar in all respects, throughout the family.

# PAPAVER SOMNIFERUM.

## LINNÆUS.

## OPIUM POPPY.

SEX. SYST.—Polyandria, Monogynia.

GEN. CHAR.—*Sepals* two, convex, deciduous. *Petals* four. *Stamens* numerous. *Style* none. *Stigmas* four to twenty, radiating, sessile upon the disk crowning the ovary. *Capsule* obovate, one-celled, composed of from four to twenty carpels, enclosed in a membranous production of the thalamus, dehiscing by short valves under the crown of the stigma. *Placentæ* between the valves, produced internally, forming complete dissepiments. (*De Candolle.*)

SPECIF. CHAR.—This plant is from two to four feet high, straight, simple or branched. The *root* is white and tapering, with some fibres. The *stems* are smooth or hairy. The *leaves* large, alternate, sessile, amplexicaul, oblong lance-shaped, margins wavy and incised or lobate, well marked by the midrib and veins. The *flowers* are large and terminal, drooping before flowering; solitary, with two concave sepals. *Petals* four, large, roundish, white or purplish; crimped upon the margin. *Capsule* ovate, large, and *seeds* round or reniform, numerous and oily.

There are two well-marked varieties, by some botanists regarded as species.

PAPAVER SOMNIFERUM.

SANGUINARIA CANADENSIS.

1. *Nigrum.* Capsules globose, seeds black, and a purplish-coloured flower. The stems in this kind are more disposed to branch; the leaves are large, ovate, lance-shaped, lobed, and the whole plant is hispidulous.

2. *Album.* Capsules ovate, large; seeds white; flowers large, white, on single peduncles; leaves oblong, dentate, or incised; whole plant smooth and glaucous.

Both of these varieties are cultivated in the gardens of Europe and this country.

The Opium Poppy is an inhabitant of Asia, where it is cultivated for its peculiar product. Asia Minor, Persia, and Hindostan, are Opium-producing countries. Egypt is also the source of some of the article. The original country of the Poppy, however, is difficult to be determined, as the plant is of extreme antiquity. The two varieties seem also to have been known as far back as the time of Hippocrates. Royle says that the "White Poppy is now cultivated in the plains of India, and the black or rather deep-red variety, in the Himalayan Mountains."

In Europe, the Poppy is cultivated for the sake of the heads and the seeds, from which the oil is extracted. The first are used for medicinal purposes, and the latter as a nutriment. The oil is employed for culinary purposes, or in the arts.

Opium is obtained from the plant in several ways. When the unripe capsules are incised, a thick viscid milk-like juice exudes, which hardens into tears; this is the purest Opium. The heads, however, are subsequently bruised, and the juice, after being pressed out, is inspissated. The two are usually commingled in Opium, and an inferior quality still is procured by decocting the capsules and leaves. The Opium of commerce is therefore a fabricated article, and depends for its purity, independent of adventitious substances introduced for the purpose of adulteration, upon the modes of manufacture.

No less than eight varieties of Opium are mentioned by Pereira, possessing distinctive characters, and named in accordance with the place of production. The production of Opium in the East is immense, where its degrading and destructive influence is far spread and of general prevalence. It is much to be regretted, that civilized nations, who pride themselves upon their religion and refinement, should have lent their aid to the perpetuation of pernicious indulgence in an article, which, when confined to its legitimate use, the alleviation of pain and disease, is among the most valuable of medicinal agents.

PLATE IX.—*Represents the plant, flower, and capsule of the Black Poppy.*

# SANGUINARIA CANADENSIS.

## LINNÆUS.

## BLOODROOT.

SEX. SYST.—Polyandria, Monogynia.

GEN. CHAR.—*Calyx* pentaphyllous, deciduous. *Petals* eight. *Stigma* sessile, two-grooved. *Capsule* superior, oblong, one-celled, two-valved; apex attenuated. *Receptacles* two, filiform, marginal. (*Nuttall.*)

SPECIF. CHAR.—*Root* tuberous, horizontal, giving out a reddish and very acrid juice. *Leaves* solitary, radical, reniform, and lobed. *Scape* naked, one-flowered, sheathed at the base. *Petals* variable in number. April. Perennial.

This plant is called Bloodroot from the red colour of the root, which, when wounded, pours out a quantity of red viscid juice. The same issues from the stalks of the leaves and the flowers, but to a less amount. It is also known by the name of Puccoon.

It grows throughout the United States, appearing in open woods at an early period of the spring, and is highly ornamental from its handsome white flowers.

The root is horizontal, from an inch to two in length, and nearly half an inch in diameter, thicker at the summit, terminating abruptly as if bitten off (præmorse), fleshy, succulent, and beset with slender red fibres or radicles. It is taken from the ground during the summer, and when dried becomes dark-brown externally, contracted, wrinkled, and somewhat twisted. It then breaks with a short waxy fracture, presenting an orange-red colour upon the fractured surfaces. Its odour is feebly narcotic, disagreeable, but lost in a measure by drying. Its taste is acrid and bitter.

A peculiar principle has been found in the root of this plant by Dr. Dana of New York. It is a white pearly substance, has an acrid taste, is sparingly soluble in water, but soluble in alcohol and ether. It is stated to act the part of a base, and has been called *Sanguinarina*. In 1803, Bloodroot was made the subject of an experimental Inaugural Essay, by Dr. Downey, of Maryland. He found that in twenty grain doses it induced nausea and vomiting, with more or less sensation of heat in the stomach, acceleration of pulse, and in several experiments, a slight degree of headache. An acrimonious impression was uniformly made upon the fauces, and in several instances it acted on the bowels. The leaves are endowed with similar powers, and the seeds exert a marked power over the brain and nervous system, occasioning torpor, languor, disordered vision, and dilatation of the pupils. These effects were confirmed in 1822, by Dr. Bird, of New York, in an Inaugural Dissertation, who speaks of depression of the pulse, faintness, dimness of vision, and alarming prostration, as its violent effects. It has been employed in a variety of affections, as of the chest, in rheumatism, &c. It was known to Shoeff as a remedy in gonorrhœa.

It is employed in powder, infusion or decoction, and in tincture.

PLATE X.—*Represents the plant in flower, and the capsule.*

# PODOPHYLLEÆ.

## LINDLEY.

ESSENTIAL CHAR.—*Sepals* three to four, deciduous, or persistent. *Petals* in two, three, or more rows, each of which is equal in number to the sepals. *Stamens* hypogynous, twelve to eighteen, arranged in two, three, or more rows; *anthers* linear, oval, turned inwards. *Stigma* somewhat peltate. *Fruit* succulent or capsular, one-celled. *Seeds* indefinite. *Embryo* small. *Herbs*. *Leaves* broad, lobed. *Flowers* radical, solitary, white. (*Beck*.)

There are few plants belonging to this family. An acrid principle exists in them. They are allied in some respects both to Ranunculaceæ and Berberidaceæ. The following is the only medicinal species.

# PODOPHYLLUM PELTATUM.

## LINNÆUS.

## MAY APPLE.

SEX. SYST.—Polyandria, Monogynia.

GEN. CHAR.—*Sepals* three. *Petals* six to nine. *Stamens* twelve to eighteen. *Stigma* large, subsessile, peltate. *Berry* somewhat fleshy, not dehiscent. *Seeds* many.

SPECIF. CHAR.—*Stem* erect, two-leaved, one-flowered. *Fruit* ovate.

May Apple has a large, horizontal, creeping, perennial, dark-brown root; the stem is from eight to twelve inches high, naked, with sheathing stipules at the base, dichotomous at the summit, dividing into two petioles two to four inches in length, each bearing a peltate leaf. The leaf is large, hanging, divided into five to seven lobes, cuneate. oblong, dentate, and often bifid at the apex. Flower solitary in the axil of the petioles; peduncle recurved, white. The fruit is an oval berry, an inch and a half long, smooth, yellowish. When mature, succulent and pulpy, having a mawkish sweet taste, edible, but not agreeable.

It is called sometimes Wild Lemon, Mandrake, and Raccoon Berry.

The plant is a native of the United States, where it is common in moist woods, and shady situations along the banks of rivulets. It flowers in May.

The root is the portion employed in medicine. It is knotted and swollen at intervals, and at these points beset with radicles. By drying it shrinks and becomes darker coloured. Internally it is whitish. The taste is sweet. bitter, and somewhat acrid. The odour is faint, but in powder it smells like ipecacuanha.

PODOPHYLLUM PELTATUM.

POLYGALA SENEGA.

The constituents, according to Dr. Staples, are resin, starch, and a peculiar crystallizable vegetable substance? Mr. Hodgson found in it a peculiar substance, to which he has given the name *Podophyllina.* (*Journ. of Phil. College of Pharmacy.*)

May Apple Root is an active cathartic, resembling jalap in its action upon the bowels. It is sometimes harsh in its operation, giving rise to tormina and profuse discharges. It was known at an early period of the settlement of this country. The leaves have emetic and purgative effects, and accidents have occurred from their use by mistake.

The dose of the powdered root is from ten to twenty grains. An extract has been directed by the United States Pharmacopœia, similar to the Extract of Jalap.

PLATE XI.—*Represents the plant in flower, and the fruit.*

# POLYGALACEÆ.

## DE CANDOLLE.

## THE MILKWORT TRIBE.

ESSENTIAL CHAR.—*Sepals* five, imbricate in æstivation, the two interior generally petaliform, the three exterior smaller; two of them are interior and sometimes united, the third is posterior. *Petals* three to five, hypogynous, more or less united by means of the tube of stamens; rarely distinct. *Filaments* of stamens adherent to the petals, monadelphous, divided at the apex into two opposite equal phalanges. *Anthers* eight, one-celled, innate, dehiscing by pores at the apex. *Ovary* one, free, two-celled, rarely one or three-celled. *Style* one. *Stigma* one. *Pericarp* capsular or drupaceous, two or one-celled. *Valves* septigerous in the middle. *Seeds* pendulous, solitary, often with a carunculate arillus at the base; *embryo* straight, generally in the axis of a fleshy albumen, or rarely exalbuminous, in which case the endopleura is tumid. *Herbs* or *shrubs*. *Leaves* entire, generally alternate, articulated on the stem. (*De Candolle.*)

To many individuals of this family pertain properties of some violence. Polygala Senega may be taken as an evidence of this; it possesses principles highly emetic and perturbatory. The peculiar principle plays the part of an acid in its chemical relations. There are some other species which have analogous properties. The *Polygala sanguinea*, according to Dr. B. S. Barton, may be substituted for the Senega, and Kiernander says that the *P. vulgaris*, of Europe, has similar virtues. Some of the plants are decidedly poisonous.

# POLYGALA SENEGA.

## LINNÆUS.

## SENEKA SNAKEROOT.

SEX. SYST.—Diadelphia, Octandria.

GEN. CHAR.—*Sepals* five, persistent, the alæ large and petaloid. *Petals* three, their claws all united with the staminiferous tube, the lower one (*carina*) keel-shaped, the two additional ones abortive. *Stamens* united into a tube at the base, which is cleft in front; *anthers* opening by a pore. *Ovary* two-celled; *ovules* solitary, pendulous from the apex of the cell. *Capsule* two-locular, loculicidal, compressed. *Seeds* pendulous, from the apex of the cells, pubescent, with a carunculate arillus at the hilum; *albumen* abundant, fleshy. *Shrubs* or herbaceous plants. *Flowers* arranged in terminal or axillary racemes. (Wight and Arnott, in Lindley's *Flora Medica.*)

SPECIF. CHAR.—*Root* perennial, large, firm, and ligneous, with coarse branches. *Stem* nine to fifteen inches high, mostly several from the same root; simple, herbaceous, rather flaccid, and oblique, terete below, slightly angular above; minutely roughish-pubescent, with numerous, small, ovate, sessile scales, like leaves, at and near the base.

*Leaves* one to two, or three inches long, and one-third of an inch to near an inch wide, smoothish, slightly serrulate or scabrous on the margin, more or less acuminately tapering at apex, and narrowed at base to a short petiole. *Spike* one to two inches long, dense, terminal, somewhat nodding, or flaccid; *pedicels* very short, each with an oblong-lance shaped bract at base, and two minute lateral bracts. *Flowers* greenish-white. *Capsule* obcordate, compressed, orbicular, retuse. *Seeds* large, pyriform, hairy.

This plant is an inhabitant of the United States; found in Pennsylvania, but more abundantly in the Southern and Western States. It flowers from June to August, and ripens its seeds as it flowers.

The root, which is the medicinal portion, is of various sizes, sometimes as thick as large quills, and at others minute and delicate. The head is disposed in the old roots to be enlarged, rough, and irregular, from the separation of the stems annually. It is branched, fibrous, contorted, and twisted, and marked by a sharp line or edge, which extends the entire length. It is composed of a cortical substance and a ligneous cord. The colour varies from dark brown to a yellow. The dried root resembles the fresh, but is broken with a short fracture. It has a peculiar, disagreeable smell, and the taste is at first sweetish, but afterwards acrid and disagreeable.

In this root have been detected two new acids by Quevenne, *Polygalic acid* and *Virgineic acid*, as also tannic acid. The first is capable of union with bases: it is the principle called by Gehlen *Senegin;* the second is volatile and oily, and may be the volatile oil detected by Dulong. The acrid taste is due to the polygalic acid.

The medical properties of Senega are determined by the dose. In large quantity it is a nauseant and emetic; in smaller, diaphoretic, expectorant, and diuretic. It cannot be regarded as poisonous, although much inconvenience may be induced by an over-dose. It is used in pulmonary affections, principally as a stimulant expectorant. It has also been proposed as an emmenagogue.

The introduction to the notice of the medical profession is due to Dr. Tennent, of Virginia, who became acquainted with it, from learning that the Indians used it as a remedy in the bites of venomous snakes: hence the name of *Snakeroot*. This remedial power, however, has not been sustained. It has been given in powder, but as it imparts its virtues to water, some of the preparations are preferred, as the decoction or syrup. Coxe's Hive Syrup owes a part of its properties to this root.

# KRAMERIÆ.

## MARTIUS.

In consequence of the great difference perceptible between the plants belonging to the genus Krameria, and those appertaining to Polygaleæ, they have been made a sub-order, under the above name.

*Sepals* five, or rarely four, more or less irregular, much spreading, coloured, deciduous in æstivation, imbricated in a triple series; the two outer ones anterior and posterior; the two intermediate ones lateral and alternate with the exterior pair; the innermost usually smaller, situated either to the right or left of the posterior exterior sepal, sometimes wanting. *Petals* five or rarely four, hypogynous, smaller than the sepals; the *three superior with long and slender claws;* the lamina sometimes abortive, severally alternating with the two (outer and inner) posterior and the lateral sepals; the claws sometimes united into a slender column, which alternates with the two posterior sepals, when both are present, or is placed opposite to the exterior sepal when the other is abortive; the two lower petals (scales, abortive stamens? *Kunth*) opposite the lateral sepals, or alternating with these and the anterior sepal, (ex. A. St. Hilaire,) sessile, fleshy, much smaller than the others, and remote from them. *Stamens* four, hypogynous, more or less unequal, declined; two usually longer, alternate with the lateral unguiculate, and the lower or fleshy parts; and two close together, alternate with the superior and the lateral petals; *filaments* thick, distinct, or the intermediate ones united, or all more or less united; *anthers* innate, fleshy, somewhat conical, two-celled, opening at the apex by a single or double pore. *Ovary* one (or incompletely two) celled, densely hairy, gibbous; *style* subulate, ascending; *stigma* minute; *placenta* posterior or next the upper petal; *ovules* two, pendulous from near the summit of the cell. *Fruit* between woody and leathery, globose, glochidate, indehiscent, one-celled, one to two seeded. *Seed* roundish-ovate, anatropous, with a membranous testa; *albumen* none. *Embryo* straight; *cotyledons* roundish, plano-convex, fleshy.

They are spreading or procumbent under-shrubs, much branched from the base, silky or hirsute, with simple

KRAMERIA TRIANDRA.

hairs. The leaves are alternate, exstipulate, simple, or rarely three-foliate, entire. *Peduncles* terminal, and axillary towards the summit of the branches, sometimes more properly racemed, one-flowered, two-bracteolate in the middle. (Torrey and Gray, in *Flor. of North America.*)

The prominent effect of the plants belonging to this family is that of astringency. Tannin exists in them to a considerable extent, as well as extractive matter.

# KRAMERIA TRIANDRA.

## LŒFLING. RUIZ AND PAVON.

## RHATANY.

SEX. SYST.—Tetrandria, Monogynia.

GEN. CHAR.—*Sepals* four, rarely five, downy exteriorly, coloured internally. *Petals* three, two orbiculate, a third formed of two to three unguiculate petals coalescing at base. *Stamina* three to four at base, sub-monadelphous; *anthers* opening by a double pore. *Fruit* indehiscent, hispid; one-celled, one-seeded. *Embryo* straight, in the centre of a fleshy albumen. Branching shrubs. *Leaves* alternate. *Flowers* sub-solitary, sessile, axillary, at the extremity of the branches. (*De Candolle.*)

SPECIF. CHAR.—The *leaves* of this species are oblong, obovate, acuminate, entire, hairy, and whitish pubescent. The *flowers* are *triandrous*, axillary, solitary, pedunculate, with two lance-shaped bracts; the *corolla* tetra-petaloid, hairy externally, within smooth, shining, and of a lake colour. *Nectary* four-leafed, two superior folioles united, spathulate; two lateral sub-rotund, concave on the inner side, on the outer scaly. *Stamina* three, fleshy. *Anthers* urceolate, with a pencil-like termination. *Style* red. *Drupe* dry, hirsute, bur-like with reddish hairs. *Plant* suffruticose. *Root* horizontal, long, very much branched; the cortical portion externally blackish-red, internally red; taste intensely styptic, bitter. *Stem* procumbent, very much branched, round, diffuse, two to three feet long, below naked, hoary, with delicate hairs; the central stem erect. (Ruiz and Pavon, *Flor. Peruv. et Chilen.*, i. 61.)

It is an inhabitant of the sandy or argillaceous dry soils, upon the declivities of the mountains of Peru; in the neighbourhood of Huanuco it is abundant. It flowers throughout the year, especially, however, in October and November. In the language of the country, it is called *Rhatany*, and *Mapato*,—hairy plant. The Spaniards call it *Raiz paro los dientes.*

To Ruiz and Pavon we are indebted for the first account of this plant; they discovered it in South America, in 1780, and found that the root was used as an astringent, in fluxes, dysentery, &c., in cases of sponginess of the gums, to fix the teeth, and as a stomachic. It is an admirable astringent, from the existence of much *tannin* in its composition. Dr. Reece, of London, in 1808, recommended it highly, since which time it has been extensively used. To water and alcohol it imparts its virtues, and it is prepared by infusion, tincture, or extract. Long boiling injures the preparation, the method by displacement is therefore admirably adapted for this root.

I am indebted to Dr. Styles, late a resident of Valparaiso, for the specimen from which the drawing has been made.

PLATE XIII.—*Represents the plant in flower and fruit, and an enlarged flower.*

# DIPTEROCARPEÆ.

## BLUME.

DIPTERACEÆ.—*Lindley.*

ESSENTIAL CHAR.—*Calyx* tubular, five-lobed, unequal, persistent, and afterwards enlarged at base, æstivation imbricated. *Petals* hypogynous, sessile, often united at the base, with a valvate æstivation. *Stamens* hypogynous, indefinite, dis-

tinct, or somewhat and irregularly polyadelphous. *Anthers* innate, subulate, with a longitudinal dehiscence near the apex; *filaments* dilated at base. *Ovary* superior, three-celled. *Ovules* in pairs, pendulous. *Style* single. *Stigma* simple. *Fruit* coriaceous, one-celled by abortion, three-valved, or indehiscent, surrounded by the calyx, which has tough, leafy, enlarged divisions, crowning the fruit. *Seeds* single, with no albumen. (Griffith, *Med. Bot.*)

The plants belonging to this family are large-sized trees, secreting juices which are more or less camphoraceous or resinoid.

# DRYOBALANOPS AROMATICA.

## GÆRTNER.

D. CAMPHORA.—*Colebrooke.*

SEX. SYST.—Monadelphia, Monogynia.

GEN. CHAR.—*Calyx* leathery, five-parted, segments equal. *Petals* convoluted in æstivation. *Stamens* numerous: their filaments consolidated in two rows into a cylindrical fleshy tube, longer than the ovary; *anthers* almost sessile on the tube, linear, mucronate. *Ovary* superior, three-celled; *ovules* two in each cell, pendulous; *style* filiform; *stigma* obscurely three-lobed, papillose. *Calyx* of the fruit cup-shaped, with the foliaceous permanent divisions equal, distant, and much shorter than the three-valved nut. (*Lindley.*)

SPECIF. CHAR.—It is a large-sized tree, near a hundred feet high, and six or seven in diameter. It is branched. The *leaves* are opposite or alternate, elliptical, obtusely pointed, entire, smooth, three to seven inches long, and one to two broad, reticulated, on short petioles, with caducous stipules in pairs. The *flowers* are terminal and axillary. *Flowers* and *fruit* as in generic description.

This tree, the only one of the genus, is a native of Borneo and Sumatra, inhabiting the plains on the northwest coast of the second island, and constituting a conspicuous occupant of them. It is limited to these localities, between the third degree North, and the Equator. It furnishes the kind of Camphor known as *Sumatra* or *Malayan*, which exists in concrete masses, in longitudinal fissures, or cavities, in the heart of the tree. The cavities are a foot or more in length. To obtain it the trees are felled and the Camphor dug out; a single tree yields about twenty pounds. The young trees also yield a volatile oil, which is called *Oil of Camphor;* this is highly fragrant. From the position of this oil, its occurrence only in the younger trees, or in the older in connexion with the Camphor, which appears to be deposited from it, its composition, and finally its artificial conversion into Camphor, it is regarded correctly as the basis of Camphor. Its composition is $C^{20}$ $H^{16}$, or isomeric with Ol. Terebinth.; hence it is a true *camphene*. The wood is imbued with this oil, hence its value for its protection from insects. Sumatra Camphor differs from the ordinary article in the large size and flattened form of the crystals, its odour, and ready reduction to powder. It is not as volatile. Crawfurd states that this Camphor is in request among the Persians, Hindoos, and Chinese, who pay an exorbitant price for it. It is seldom brought to this country. Two specimens in my possession, one in large white crystals, the other in smaller crystals, and discoloured, were brought from Canton. The medical virtues are the same as those of the commercial kind.

PLATE XIV.—*Represents a branch of the tree, and the flower.*

# GUTTIFERÆ.

## JUSSIEU.

## THE MANGOSTEEN TRIBE.

CLUSIACEÆ.—*Lindley.*

ESSENTIAL CHAR.—*Sepals* two or six, usually persistent, round, frequently unequal and coloured; æstivation im-

DRYOBALANOPS AROMATICA.

HEBRADENDRON CAMBOGIOIDES.

bricated. *Petals* hypogynous, four to ten. *Stamens* hypogynous, indefinite or rarely definite, distinct, or variously united at the base; *filaments* unequal; *anthers* adnate, introrse or extrorse, sometimes very small, sometimes unilocular, and sometimes opening by a pore. *Torus* fleshy, occasionally five-lobed. *Ovary* solitary, one or many-celled; *ovules* solitary, or several in each cell, erect or ascending, or numerous and attached to several placentæ; *style* usually none or very short, seldom conspicuous; *stigmas* peltate, or radiate. *Fruit* capsular or fleshy, or drupaceous, one or many-celled, valvular and septicidal, or indehiscent. *Seeds* definite, in a pulp, apterous, often arillate; *testa* thin and membranous; *albumen* none; *embryo* straight; *radicle* small, next to the hilum; *cotyledons* large, thick, and fleshy, often cohering. (*Wight and Arnott.*)

The plants belonging to this family are shrubs or trees, sometimes parasitical. Their leaves are opposite, rarely alternate, coriaceous, and shortly petioled. The flowers are axillary, very often disposed in terminal or lateral panicles. They are for the most part confined to tropical countries. Fée remarks, that this family preserves in all its genera the law of analogies. They abound in a gum-resinous juice, combined with a yellow colouring principle; it is acrid in some instances, also bitter and purgative. The fruit is for the most part esculent, and as in the Mangosteen of India, is delicious.

# HEBRADENDRON CAMBOGIOIDES.

## GRAHAM.

Sex. Syst.—Monœcia, Monadelphia.

Essential Char.—*Flowers* unisexual. *Males: Sepals* four, membranous, permanent. *Petals* four. *Stamens* monadelphous, with a quadrangular column; *anthers* terminal, with an umbilicated circumscissile operculum. *Females* similar to the males. The *flowers* are white, and a little larger, with a germen in miniature of the fruit, and surrounded like it with several (ten?) abortive stamens, crowned by a lobed and muricated sessile stigma. *Berry* many (four) celled; *cells* one-seeded. *Cotyledons* thick, consolidated; *radicle* central, filiform. (*Graham. Royle.*)

Specif. Char.—A tree of moderate size. *Leaves* opposite, petiolate, obovato-elliptical, abruptly sub-acuminate, coriaceous, smooth, shining, dark-green above, paler below; veins in the recent state inconspicuous, especially above; in the dried state, distinct on both sides. *Flowers* unisexual, monœcious. *Male* small, (eight to nine lines across,) clustered in the axils of the petioles, on short peduncles. *Sepals* four, sub-unequal, imbricated, concave, membranous, veined, the outer sub-entire and somewhat coriaceous in the bud, the inner sparingly denticulo-ciliate, yellow on the inside, yellowish-white on the outside. *Petals* four, spathulate, elliptical, coriaceous, crenulate, longer than the calyx, yellowish-white, red on the inside near the base, deciduous. *Stamens* monadelphous; column four-sided; *anthers* in a roundish capitulum, terminal upon a short clavate free portion of the filament, opening by the circumcision of a flat umbilicate lid; *pollen* yellow, granules elliptical. *Female* as in generic account (*Royle*). *Berry* about the size of a cherry, round, with a firm reddish-brown external coat, and sweet pulp, four-locular, surrounded at the base by the persistent calyx, and a few free abortive stamens; crowned with the four-lobed, tuberculated, sessile stigma; locament single-seeded. *Seeds* large in relation to the berry, reniform, elliptical, compressed laterally, integuments yellowish-brown, easily separable into two layers; *cotyledons* thick, cohering into a uniform cellular mass; *radicle* central, filiform, slightly curved. (*Graham.*)

This plant is a native of Ceylon. It was described under the above name by Dr. Graham, of Edinburgh, who obtained specimens from Mrs. Col. Walker, a resident of the island. It yields Gamboge, which, if not identical with that from Siam, is at least so nearly similar, according to the statement of Dr. Christison, as to render it probable that it is the true plant, or a closely allied one. The Gamboge plant had been stated by Murray to be the *Stalagmitis Cambogioides*, and described from the MSS. of König, and a specimen furnished him by Sir Joseph Banks, now in the British Museum. This specimen was subsequently found, by Mr. Brown, to be composed of two plants united by sealing-wax, the one under consideration, and *Xanthochymus ovalifolius*, so that Murray's information is not authoritative. The Hebradendron cambogioides differs from Garcinia, so that the name *G. Morella*, which was given to this plant, must cede to the name of Dr. Graham. It is called in Ceylon *Kana Goraka*.

The manner of obtaining the substance, is to incise the tree or remove the bark, when it flows freely, and hardens by exposure. Royle states that the Ceylon Gamboge is found in the Bazaars of India.

The Gamboge of Siam is the product of a tree most probably allied to the preceding, but with respect to which no precise knowledge exists.

Gamboge is a gum-resin; the Siam and Ceylon are so similar in composition, according to the experiments of Dr. Christison, that they may be regarded as nearly identical.

The Ceylon Gamboge is a purgative, equal in efficacy to the commercial kind. It has been experimented with by Drs. Christison and Graham.

PLATE XV.—*Represents the plant in flower, the organization of the flower, and the fruit.*

# MELIACEÆ.

## JUSSIEU.

ESSENTIAL CHAR.—*Calyx* monosepalous, in four or five divisions, more or less profound. *Corolla* composed of four or five petals, sessile, equal or unequal, sometimes connected at base. *Stamens* definite, of the same number, or double that of the petals; they are always united, sometimes at base only, sometimes completely, so as to form a tube enclosing the pistil, the *anthers* prominent. The pistil is free, surrounded by an annular disk, under which are inserted the petals and stamens. The *ovary* contains four or five cells, in each two ovules, attached to the inner and upper angle. The *style* is always simple, terminated by a stigma, either simple or obscurely lobed. The *fruit* is dry, or fleshy, composed of four or five cells, each containing one or two seeds, and opening by four or five septiferous valves. The *seeds* are composed of a fleshy endosperma, in which is the inverted embryo.

The Meliaceæ are trees or shrubs, inhabiting the warmer regions of the earth; the leaves are either simple and alternate, or compound, without stipules. In properties they are tonic and bitter, or sometimes emetic and purgative, or poisonous. Martius has made the sub-order *Canellæ* from the following plant, with those allied to it.

# CANELLA ALBA.

## MURRAY.

SEX. SYST.—Dodecandria, Monogynia.

GEN. CHAR.—*Sepals* three. *Petals* five, somewhat coriaceous, glaucous, blue, twisted in æstivation. *Stamens* combined in a tube; *anthers* fifteen, resembling furrows. *Stigmas* three. *Berry* three-celled, or by abortion sometimes one-celled; *cells* one to two-seeded. *Embryo* surrounded by fleshy albumen, curved, with linear cotyledons. (*De Candolle.*)

SPECIF. CHAR.—A tree ten to fifty feet high. *Leaves* alternate, shining, obovate, cuneate at the base, entire, somewhat emarginate, coriaceous, and opaque when old, dotted when young, petiolate, obscurely nerved. *Flowers* in terminal, somewhat spiked clusters, of a violet-purple colour. *Berry* the size of a pea, fleshy, smooth, bluish-black. The blossoms are extremely fragrant.

All parts of the tree are aromatic and pungent. The bark, which is the medicinal portion, is of a whitish colour, with a rough, silvery, cracked epidermis, which peels off entirely in mass from the true bark.

The Canella Alba is a native of the West Indies, and the northern part of South America.

This tree was formerly confounded with that affording true Winter's Bark. Bauhin first committed this error, and afterwards Linnæus, who at first described the two as *Laurus Winterana*, and afterwards made a distinct genus for both under the name Winterana, taking the characters, however, from the Canella, and calling it *W. Canella.*

CANELLA ALBA.

GUAIACUM OFFICINALE.

Browne made the Canella a distinct genus, the only species of which is the *C. Alba* of Murray, while the Winter's Bark tree was called, when fully determined, *W. aromatica*, since Drimys, which see.

The bark is introduced into the market in quilled or flat pieces, rough externally, of a pale orange-colour, with lighter spots, and whitish internally. It breaks with a short fracture, and has an aromatic odour, with a warm, biting, bitter taste. It contains volatile oil, resin, bitter extractive, and a sweet substance, *Canellin*.

The medical properties are those of a stimulant and tonic; it is given in powder, infusion, and tincture.

PLATE XVI.—*Represents the plant in flower, and the fruit.*

# ZYGOPHYLLEÆ.

## R. BROWN.

## BEAN CAPERS.

ESSENTIAL CHAR.—*Sepals* five, distinct, or scarcely coherent at the base. *Petals* five, alternate with the sepals, inserted on the receptacle. *Stamens* ten, distinct, hypogynous, five opposite to the sepals, and five to the petals. *Ovary* single, five-celled; *styles* five, united into one, sometimes rather distinct at the apex. *Capsule* of five carpels, which are more or less adnate to each other and to the central axis; *cells* dehiscent at the superior angle, usually many-seeded, or one-seeded, neither cocculiferous nor ariliferous. *Seeds* albuminous or commonly exalbuminous; *embryo* straight; *radicle* superior; *cotyledons* foliaceous. (*De Candolle.*)

Herbs, shrubs, or trees. They abound in the tropical portion of the world. The Guaiacums are possessed of resin, and have stimulating properties.

# GUAIACUM OFFICINALE.

## LINNÆUS.

SEX. SYST.—Decandria, Monogynia.

GEN. CHAR.—*Calyx* five-partite, obtuse. *Petals* five. *Stamens* ten, with filaments naked, or sub-appendiculated. *Style* and *stigma* one. *Capsule* substipitate, five-celled, five-angled, or from abortion two to three-celled; *seeds* solitary, fixed to the axis, pendulous; *albumen* cartilaginous, rimulose; *cotyledons* thickish. (*De Candolle.*)

SPECIF. CHAR.—A tree from forty to sixty feet high, with crowded flexuose branches. *Leaves* opposite, bijugate; *leaflets* sessile, more or less obovate, rounded at the apex, nerved, glabrous, the common petiole terete, channelled above. *Peduncles* axillary, one to three together, an inch in length, one-flowered, filiform, minutely puberulous. *Calycine sepals* five; two exterior somewhat broader than the others; all of them obtuse and incano-tomentose. *Petals* five, thrice the length of the sepals, oblong, bluntish, blue, hairy. *Filaments* ten, twice the length of the sepals, grooved at the back; *anthers* bifid at the base, arcuate, yellow. *Style* and *stigma* simple. *Fruit* a fleshy capsule, of a reddish-yellow colour; two to five-seeded.

The bark of this tree is thick and smooth, and of a grayish colour. The wood is exceedingly hard. It is known as the *Lignum Vitæ* of commerce, used by turners in the fabrication of articles requiring density and strength.

The Guaiacum is a native of the West India Islands, growing in Cuba, St. Domingo, and Jamaica.

The wood is composed of the heart-wood and sap-wood, the first abounding in resin, which communicates to it a deep-green colour; but this resin is also found in the bark, from which it pours by abrasion or incision in the form of tears. It is dark, shining, and friable.

The wood and resin are both used for medicinal purposes. The latter is obtained in mass by boring billets at one end and then heating the other, which drives it out at the orifice.

The medical properties are those of a stimulant, alterative, and diaphoretic.

The Spaniards first imported the Guaiacum wood from America into Europe, in 1505. It had the reputation of curing syphilis, and as at the time mentioned that disease was most destructive, it was called *Holy Wood* and *Wood of Life*. Van Hutten having, in 1519, been cured by it, greater reputation was acquired than it deserved. It is certainly a useful remedy.

The mode of administering the wood is to boil the raspings or chips in water, so as to form a decoction. Guaiacum resin is given in powder or in tincture.

PLATE XVI.—*Represents the plant in flower, and the fruit.*

# DIOSMEÆ.

## ADR. JUSSIEU.

ESSENTIAL CHAR.—*Calyx* free. *Petals* equal in number to the segments of calyx, sometimes combined. *Stamens* equal to or twice as many as the petals, the alternate ones opposite to them, then shorter or without anthers. *Ovaries* several, free, or more or less united, two-ovuled. *Ovules* affixed to the axial angle, collateral, or obliquely placed one over the other, very rarely with four ovules. *Fruit* separable into several carpels, which by abortion are often single-seeded; *endocarp* cartilaginous, free, two-lobed, and elastic. *Seeds* inverse. *Embryo* included in albumen, or without albumen. (Royle, *Mat. Med.*)

The plants belonging to this tribe were formerly embraced by Rutaceæ, or Zanthoxyleæ, to both of which they have a close resemblance. They are distinguished, however, by the endocarp in the ripe capsule. They are characterized by volatile oil and resin, and in some cases a bitter principle.

# BAROSMA CRENULATA.

## WILLDENOW.

DIOSMA CRENULATA.—*Linnæus.* D. ODORATA.—*De Candolle.*

SEX. SYST.—Pentandria, Monogynia.

GEN. CHAR.—*Calyx* pentafid or five-partite. *Petals* five, inserted into the base of the disk, which lines the bottom of the calyx, and has a short scarcely prominent rim. *Stamens* ten, inserted with the petals, and equal to them in length, five fertile, alternating with the petals; *filaments* filiform, subulate, with the *anthers* commonly terminated by a short gland, often becoming recurved, five opposite to and shorter than the petals, sterile, petaloid, indistinctly glandular at the apex. *Ovaries* five, united into one, five-lobed, and auriculate at the apex, commonly with a glandular tubercle. *Style* longer than the stamens. *Stigma* minutely five-lobed. *Fruit* composed of five compressed cocci, outwardly auriculate, and covered with glandular dots. *Seed* oblong. (*Royle.*)

The plants belonging to this genus, are shrubs of the Cape of Good Hope. Their leaves are opposite or alternate, leathery, flat, dotted, especially near the margin, varying in shape. Flowers axillary, on single or three-flowered peduncles, or fasciculate in single-flowered peduncles.

SPECIF. CHAR.—*Leaves* decussate, ovate, oblong, on very short petioles, very obtuse, minutely crenated, quite smooth, and of a darkish-green colour above, beneath paler, with a few obscure oblique nerves dotted with oil vesicles, with, at every crenature, a conspicuous pellucid gland, and a pellucid margin round the whole leaf. *Peduncles* axillary and terminal, chiefly from the axils of the superior leaves; single-flowered, often bearing a pair of small opposite leaves or bracts about the middle. *Calyx* of five ovate-acuminate leaflets, green, tinged with purple. Beneath the calyx are two or three pairs of small imbricate bracts. *Corolla* of five ovate petals, purple in bud, bluish-coloured when expanded.

This plant is an upright shrub, an inhabitant of South Africa. The leaves are brought to this country along with those of other species of the genus, under the name of *Buchu* or *Buku*: they constitute the second kind, of Dr. Pereira.

BAROSMA CRENULATA.

GALIPEA CUSPARIA.

Buchu contains two important principles, among others, viz.: volatile oil and bitter extractive (*Diosmin*), and consequently has a strong peculiar odour, and a warm and bitter taste.

The medicinal properties of Buchu are principally exercised in diseases of the urino-genital apparatus, and much evidence has been adduced in its favour. It was introduced about 1823, by Dr. Reece, of London. The mode of administration is in powder, infusion, and tincture.

PLATE XVIII.—*Represents the plant in flower, and an enlarged flower and fruit.*

# GALIPEA CUSPARIA.

## ST. HILAIRE.

BONPLANDIA TRIFOLIATA.—*Willdenov.* CUSPARIA FEBRIFUGA.—*Humboldt and Bonpland.*

SEX. SYST.—Pentandria, Monogynia.

GEN. CHAR.—*Calyx* short, five-toothed. *Petals* five, united into a salver-shaped corolla, or closely approximating; *tube* short, pentagonal; *lobes* spreading, acute. *Stamens* four to seven, hypogynous, somewhat adherent to the petals, unequal, sometimes all fertile, commonly two antheriferous, two to five shorter, sterile. *Nectary* cupuliform. *Styles* five, afterwards combined into one, and forming a four or five-grooved stigma. *Carpels* five, or by abortion fewer, containing two ovules, obtuse, cocculiform, sessile, with a separable endocarp. *Seeds*, by abortion, solitary; *cotyledons* large, corrugated, biauriculate. (*De Candolle.*)

Smooth trees, with alternate simple or pluriform leaves; *leaflets* oblong, acuminate. *Peduncles* axillary, many-flowered.

SPECIF. CHAR.—A tree from sixty to eighty feet high, evergreen, with an ash-coloured bark, and pale yellow box-coloured wood. *Leaves* alternate, long-stalked; *leaflets* three, sessile, unequal, ovate, lance-shaped, acute, smooth, entire, bright-green, gratefully fragrant, with scattered glandular dots. *Flowers* in axillary and terminal racemes, on a peduncle as long as the petioles. *Calyx* and *corolla* white, with fascicles of hairs, seated on glandular bodies, on the outside. *Anthers* with two short appendages.

This is the tree which, by Humboldt and Bonpland, has been asserted to yield *Angostura Bark*. It grows in the forests of South America, between Cumana and New Barcelona. Hancock has attributed it to another species, the *G. officinalis;* it is probable, however, that both may yield an analogous bark.

This article of the Materia Medica is in quilled or flat pieces, having an aromatic odour, and a bitter taste. It contains volatile oil, resin, and a neutral crystallizable principle, *Angosturin*. It is called Angostura Bark, from its having come originally from the neighbourhood of the town of that name. Mutis is stated to have been acquainted with this bark in 1759. It was introduced in England in 1789.

The medical properties are those of a stimulant tonic, used in fevers, &c. The mode of administration is in infusion, tincture, or powder.

PLATE XIX.—*Represents the plant in flower.*

# BURSERACEÆ.

## KUNTH.

## BALSAMIADS.

ESSENTIAL CHAR.—*Calyx* free, three to five-fid, persistent. *Petals* equal in number to divisions of the calyx, inserted below the annular or circular disk. *Stamens* inserted with the petals, and double their number. *Ovary* free,

sessile, two to five-celled. *Ovules* in pairs, side by side in each cell, suspended from the apex of the central angle. *Style* simple or wanting. *Stigma* undivided, two to five-lobed. *Fruit* hard, bony, one to five-celled, often single-seeded; *epicarp* dry, usually resinous, sometimes splitting into valves. *Seeds* without albumen, pendulous; *cotyledons* wrinkled or plaited; *radicle* small, superior, straight, turned towards the hilum. (*Royle.*)

Trees or shrubs, with resinous juice, leaves alternate, impari-pinnate, or ternate.

# BALSAMODENDRON MYRRHA.

## NEES VON ESENBECK.

## MYRRH TREE.

Sex. Syst.—Octandria, Monogynia.

Gen. Char.—*Flowers* irregular. *Calyx* four-toothed, persistent. *Petals* four, linear, oblong; æstivation indupli-cate, valvate. *Stamens* eight, inserted under the annular disk; elevated warts between the stamens. *Ovary* one. *Style* one, short, obtuse. *Berry* or *drupe* ovate, acute, with four sutures, one to two-celled; *cells* one-seeded. *Leaves* pinnated; *leaflets* three to five, sessile, without dots. (*De Candolle.*)

Specif. Char.—A shrubby plant, with squarrose, spinescent branches, covered with a pale ash-gray bark, ap-proaching white. Wood yellowish-white; both it and the bark have a peculiar odour. *Leaves* on short stalks, ternate; *leaflets* obovate, obtuse, obtusely toothletted at the apex, the lateral smooth. *Flowers* unknown. *Fruit* ovate, acumi-nate, smooth, brown, somewhat larger than a pea, surrounded at the base by a four-toothed calyx, and supported on a very short stalk.

This plant is figured and described by Nees von Esenbeck in his great work, *Beschr. Offic. Planz.*, by the name given above. He obtained his information and specimen from Ehrenberg, who met with it on the borders of Arabia Felix, and procured the true Myrrh from the plant. According to him, the substance exudes from the bark of the tree, at first soft and oily, and of a yellow colour, but becoming hard and dark-coloured by exposure.

Prof. Lindley has called the genus Protium to which this plant belongs, and supposes the *Amyris Kataf* of Forskäl, which is the *Balsamodendron Kataf* of Nees, to be identical; the reasons, however, given by Pereira, for differing from him are satisfactory, viz., the thornless character of the A. kataf, the larger size of the leaves, and the round, depressed, umbilicated point of the fruit.

The history of Myrrh dates from great antiquity; it was known to all the older nations of the earth. The origin, however, was not settled among botanists, until the return of Ehrenberg and Hemprich from their travels. With regard to the origin of the kinds found in commerce, some mystery has still to be removed.

Myrrh is a gum-resinous substance, and, from the places whence shipped, is called *Turkey Myrrh*, and *East India Myrrh*. It has an aromatic odour and a bitter taste. It contains gum, resin, hard and soft, and volatile oil. The hard resin is acid, and has been called *Myrrhic acid*.

The article is tonic and stimulating, employed for its roborant effects, and as an emmenagogue. It is given in powder, mixture, or tincture.

Plate XX.—*Represents the plant in leaf, and the fruit.*

BALSAMODENDRON MYRRHA.

QUASSIA AMARA.

# SIMARUBEÆ.

## RICHARD.

## QUASSIADS.

SIMARUBACEÆ.—*Lindley.*

ESSENTIAL CHAR.—*Flowers* hermaphrodite, or by abortion unisexual. *Calyx* four or five-partite, persistent, imbricate in æstivation. *Petals* equal in number to, alternate with, but longer than the divisions of the calyx; æstivation twisted, deciduous. *Stamens* equal in number, or twice as many as the petals, inserted on a hypogynous disk, free. *Ovary*, with lobes as numerous as the petals; *style* one, filiform, enlarged at base. *Carpels* as many as the petals, articulated on the axis, capsular, bivalved, dehiscing inwardly, monospermous. *Seeds* exalbuminous, pendulous; *cotyledons* two, thick; *radicle* short, superior. Trees or shrubs, leaves alternate, pinnate, without stipules. (*De Candolle.*)

This is a small family, and a remarkable analogy exists throughout all the members of it. A principle, bitter and tonic, has been detected in them, upon which their medical properties depend; it is the same in all, and has, from the generic name Quassia, been called *Quassin*. A milky juice is said to exude from the bark. They are tropical plants, and are found both in the eastern and western hemispheres.

# QUASSIA AMARA.

## LINNÆUS.

SEX. SYST.—Decandria, Monogynia.

GEN. CHAR.—*Flowers* hermaphrodite. *Calyx* short, persistent, prominent, with five deep divisions. *Petals* five, much longer, arranged in a tubular form, twisted in æstivation. *Stamens* ten, long, exserted, provided at base with a hairy scale. *Ovaries* five, placed on a broad receptacle. *Styles* five-partite below, but united into a long exserted one, with a five-furrowed stigma. *Fruit* drupaceous.

SPECIF. CHAR.—A small *tree* from six to ten feet high, straight, irregularly-branched, with an ash-coloured, smooth bark. The *leaves* are sparse, occupying, generally, the summit of the branches, very smooth, pinnate; *leaflets* sessile, in pairs, usually two with an odd one, entire, elliptical, acute, reticulated, a little revolute on the margin, of a deep green with a reddening of the veins above, and lighter beneath; *petiole* winged, with the joints cuneate. *Racemes* long, simple, terminal. *Flowers* large, scarlet, with short pedicels and a recurved bract at base. The fruit is black and ovoid.

This plant is a native of Surinam, Guiana, and other parts of South America. It is cultivated in the West Indies.

The knowledge of the virtues of this plant are by some authorities attributed to Mr. Rolander, by others to Governor Dalberg. About the year 1756, the first-named gentleman, a distinguished Swedish naturalist and traveller, returned from Surinam and placed his specimens at the disposal of Linnæus; he had discovered that the wood, generally the root, was employed in the treatment of the fevers of the country as a secret remedy. A negro by the name of *Quassi* sold the knowledge of the article, and Linnæus accordingly gave to the plant its generic name. The Quassia-wood of commerce, however, has not been obtained from this source since the discovery of a congener next to be considered, which has taken its place.

The wood, in fact, all parts of the tree, are possessed of intense bitterness, owing to the existence of *Quassin* in

them. The medical properties are those of a tonic and roborant, but in the colony, according to Lindley's statement, on the authority of Mr. Lanae, Quassia-wood is no longer used as a medicine, being thought to have some bad properties along with its intense bitter.

PLATE XXI.—*Represents the plant in flower, and the fruit.*

# QUASSIA EXCELSA.

## SWARTZ.

## THE LOFTY BITTER-WOOD TREE.

PICRÆNA EXCELSA.—*Lindley.* P. AMARA.—*Wright.* SIMARUBA EXCELSA.—*De Candolle.*
SEX. SYST.—Decandria, Monogynia.

This plant has been made the basis of a new genus by Lindley, and of one by De Candolle, including another plant with it. Where generic characters which would place it with Quassia fail, it happens, apparently, by abortion, and we have preferred to retain the old name of Swartz. The sexual arrangement is difficult. From the unisexual flowers of both kinds, produced by abortion, intermingled with the hermaphrodite, it should be located in Polygamia, Monœcia. The use of this class, however, has been abandoned by most botanists, and we have specified in the appropriate place the class and order of the genus Quassia. The

GEN. CHAR., as given by Lindley, is the following. *Flowers* polygamous. *Sepals* five, minute. *Petals* five, longer than the sepals. *Stamens* five, about as long as the petals, rather shaggy; *anthers* roundish. *Ovaries* three, seated on a round, tumid receptacle. *Style* three-cornered, trifid; *stigmas* simple, spreading. *Fruit* three, globose, one-celled, two-valved drupes, which are distinct from each other, placed on a broad hemispherical receptacle. (*Flor. Med.*)

SPECIF. CHAR.—A tree fifty to sixty feet high, with the branches spreading, the bark rimose, ash-coloured. *Leaves* alternate, impari-pinnate; leaflets opposite, shortly petioled, oblong acuminate, unequal at the base, blunt at the apex, venose, glabrous. *Racemes* towards the ends of the branchlets, axillary, very compound, panicled, sub-corymbose, dichotomously branched, spreading, diffuse, many-flowered. *Peduncles* compressed, rufescent, downy. *Flowers* small, pale, polygamous. *Filaments* of the male flower much larger than the petals; in the fertile, of the same length. In the male merely the rudiments of the pistil; in the fertile, *ovaries* three; *style* longer than the stamens, three-quetrous, trifid. *Drupes* three, but only one coming to perfection, the size of a pea, black, shining, fixed on a hemispherical receptacle; *nut* solitary, globose, with the shell fragile. (*Macfadyen.*)

In Jamaica, where it is abundant, the plant is called *Bitter ash* and *Bitter-wood;* it grows in the mountains of this island, and others appertaining to the West Indies. The wood is excellent timber, takes a polish, and is used in flooring, or for articles of furniture, as it is obnoxious to insects.

This wood is imported in billets, covered with the smooth, grayish, sometimes silvery bark. It is white, light, and even in its texture, but becomes darker from exposure. The taste is intensely bitter. It contains the bitter principle *Quassin.*

The medical effects are those of a pure bitter, tonic and roborant, and as such Quassia-wood is used in convalescence, dyspepsia, &c. The mode of exhibition is in cold infusion, made from the chips or raspings, or in tincture. In France it is a practice to have cups turned from the wood, and to allow water to stand in them until it becomes imbued with the active principle.

PLATE XXII.—*Represents the plant in flower, the flower and fruit.*

# CALYCIFLORÆ.

Plants possessing a calyx and corolla. Petals usually distinct. Stamens *perigynous.*

QUASSIA EXCELSA.

ACACIA ARABICA.

# LEGUMINOSÆ.

## ADR. JUSSIEU.

## THE BEAN TRIBE.

FABACEÆ.—*Lindley.*

The Bean tribe, or Leguminous plants, are generally regarded as presenting marked affinities. Although these are marked in the entire family, yet there is so much dissimilarity in groups of which it is composed, as to admit of subdivision.

ESSENTIAL CHAR.—The plants composing it may be either herbs, shrubs, or trees. Their *leaves* are alternate and compound, sometimes doubly so, accompanied with two stipules. *Flowers* variously arranged. *Calyx* free, with five divisions, unequal usually, the odd segment anterior. *Petals* inserted into the calyx, sometimes into the receptacle, unequal, with the odd petal posterior, as numerous as the segments of the calyx; by abortion fewer. *Stamens* double the number of the petals, or more numerous, inserted with the petals, free; or the filaments connected, monadelphous or diadelphous. *Ovary* simple, superior, becoming a legume or tomentum. *Legumes* two-valved, membranous, or coriaceous, dehiscent or indehiscent. *Seeds* numerous, fewer by abortion. *Cotyledons* foliaceous or fleshy. *Embryo* straight or curved. From the dissimilarity above presented, the necessity is apparent of arranging the plants comprising the family in suborders, which are MIMOSEÆ, CÆSALPINEÆ, and PAPILIONACEÆ.

Many of these plants, in consequence of fecula and nutritious matter in the seeds, are cultivated for their esculent properties. A great range of medical activity, however, is to be met with, which is most easily pointed out in the suborders.

# MIMOSEÆ.

## R. BROWN.

## MIMOSIADS.

ESSENTIAL CHAR.—*Flowers* unisexual, regular, spiked or capitate. *Calyx* free, four to five-parted. *Petals* equal in number to the divisions of the calyx, alternate with them, inserted into the receptacle, free or united. *Stamens* free, hypogynous, or monadelphous, numerous. *Legume* usually bivalved, one-celled or divided by partitions and jointed. *Embryo* straight; *cotyledons* large.

The plants comprised by this suborder are, for the most part, natives of the hotter portions of the earth, a few are found in northern, but a large number in south temperate regions. The characteristic principles which they secrete are gum and astringent extractive.

# ACACIA ARABICA.

## WILLDENOW.

ACACIA NILOTICA.—*Delile.* MIMOSA ARABICA.—*Roxburgh.*

SEX. SYST.—Polygamia, Monœcia.

GEN. CHAR.—*Flowers* polygamous. *Calyx* four to five-toothed. *Petals* four to five, either free or cohering to

form a four or five-cleft corolla. *Stamens* varying in number, ten to two hundred. *Legume* continuous, juiceless, two-valved. Shrubs or trees. *Thorns* stipular, scattered or none. *Flowers* yellow, white, or rarely red, capitate or spiked. (*De Candolle.*)

Specif. Char.—A tree sometimes attaining the height of forty feet, usually smaller. *Spines* in pairs, usually short. *Branches* and *petioles* pubescent. *Leaves* bipinnate, with four to six pairs of pinnæ, with a gland between the first and between the last pairs. *Leaflets* ten to twenty pairs, oblong, linear, minute, smooth. *Flowers* yellow, fragrant, in oblong, globose heads, stalked, axillary, and subternate. *Legume* stalked, moniliform, long and curved, compressed, contracted on both sutures between each seed.

This species of Acacia is a native of Egypt, Senegal, Arabia, and India. Along with others, it affords the article known as Gum Arabic. By Ehrenberg it is considered to be a variety of the A. vera. The fruit of it is employed as a tanning and dyeing agent in the East; it is called *bablah.*

Gum Arabic exudes in the form of tears, by natural or artificial fissures. The qualities of it are various, and it has different appellations according to its origin. It is nutritious and demulcent.

Plate XXIII.—*Represents the plant in flower, and an enlarged flower and fruit.*

# ACACIA CATECHU.

## WILLDENOW.

Mimosa catechu.—*Linnæus.*

Sex. Syst.—Polygamia, Monœcia.

Specif. Char.—A tree from fifteen to twenty or thirty feet high, with hard and heavy wood, of which the interior is of a dark red or brownish colour, and the sap-wood white. *Branches* with stipulary thorns. *Leaves* bipinnate. *Pinnæ* ten to fifteen pairs. *Leaflets* thirty to fifty pairs, linear, oblong, unequal and auriculed on the under side, with one large urceolate gland below the lowest pair of pinnæ, and smaller ones between the second to fourth terminal ones. *Inflorescence* a spike, one to three together in the axillæ of the leaves. *Flowers* numerous, white. *Calyx* downy, five-fid. *Petals* united into a five-fid corolla. *Stamens* numerous, distinct, double the length of the corolla. (The flower has a yellow appearance from the numerous yellow anthers.) *Ovary* shortly stipitate. *Style* the length of the stamens. *Legumes* straight, thin, flat, and smooth, with about four to six seeds. (*Royle*, from Roxburgh.)

This plant is a native of various parts of India; the drug obtained from it, under the idea that it was an earth, and came from Japan, was called *Terra Japonica.* Mr. Kerr first presented an account of the plant from which it is obtained, and the mode of extracting the drug; his paper is contained in the Medical Observations and Inquiries for 1779. Dr. Macfadyen states in his *Flora Jamaicensis* that the plant has been introduced into Jamaica, and that in some districts it has been planted to form fences, receiving, incorrectly, the name of the *Jerusalem Thorn.*

For the extraction of Catechu, the inner heart-wood, duramen, is cut into chips and boiled in earthen pots, the liquor being subsequently strained and evaporated. When soft, the extract is made into cakes usually of a round or quadrangular form. It is called *Kutch.* It is not the only article, however, known as Catechu; for an account of the several kinds, we refer to Pereira's *Materia Medica*, which contains a very full chapter on the subject.

Catechu contains *tannin* and a peculiar substance, common in the several varieties of the drug, called *catechine.* The tannin affords greenish-black precipitates with the salts of iron.

Catechu is a valuable astringent; it may be used in all cases where astringents are proper. The mode of exhibition is in powder, infusion, and tincture. It enters into the composition of some compound preparations.

Plate XXIV.—*Represents the plant in flower, and the enlarged flower and fruit.*

ACACIA CATECHU.

HÆMATOXYLON CAMPECHIANUM.

# CÆSALPINEÆ.

## BROWN.

Essential Char.—*Calyx* five-toothed or bilabiate, deciduous and withering on the plant. *Corolla* irregular, imbricated, subpapilionaceous, or nearly regular, spreading, of five petals, which are free, inserted into the bottom of the calyx. *Stamens* ten, or fewer from abortion, often unequal, perigynous, or inserted with the petals, usually free, sometimes united. *Ovary* free, placenta unilateral. *Seeds* without albumen. *Embryo* straight. *Leaves* alternate, stipulate, impari- or abruptly pinnate, sometimes single. (Royle, *Mat. Med.*)

This division of Leguminosæ abounds in tropical parts of the world, but a few are found in more temperate latitudes. The medical properties of them are somewhat varied; some contain astringent matter, others a purgative principle.

# HÆMATOXYLON CAMPECHIANUM.

## LINNÆUS.

## LOGWOOD.

Sex. Syst.—Decandria, Monogynia.

Gen. Char.—*Calycine* sepals five, coalescing at the base into a short, subpersistent tube; *segments* deciduous, oblong, obtuse. *Petals* five, scarcely longer than the calyx. *Stamens* ten, with the filaments pilose at the base, and the *anthers* eglandulose. *Style* capillary. *Legume* compressed, plane, lance-shaped, acuminate at both ends, one-celled, two-seeded; *sutures* closed, bursting longitudinally at the middle of the valves; *seeds* transversely oblong; *cotyledons* two-lobed. (*De Candolle.*)

Specif. Char.—A low, spreading tree; *stem* generally crooked and deformed, seldom thicker than a man's thigh; *branches* somewhat flexuose, terete, albido-punctate; in mountain and moist situations unarmed; in plains, or where the tree is stunted, furnished with spines below the leaves. *Leaves* two to four from the same point, (an irregular, rough, tuberculated prominence,) pinnate, sometimes dividing in a bipinnate manner at the lowest pair of leaflets; *leaflets* four-paired, shortly petiolated, obovate or obcordate. *Racemes* at first about the length of the leaf, afterwards as the pods form elongating. *Flowers* on pedicels, half an inch in length, yellow, slightly fragrant. *Calyx* deeply five-partite; *lobes* unequal, thin, membranaceous, purpurascent, deciduous; *tube* short, green, bell-shaped. *Petals* subequal, obovate, wedge-shaped at the base, scarcely longer than the sepals. *Stamens* alternately short, inserted, as also the petals, on the inside of the margin of the persistent tube of the calyx; *anthers* ovate. *Ovary* lanceolate, compressed, three-ovuled. *Style* projecting beyond the stamens and petals; *stigma* capitate, expanded. *Pods* compressed, plane, lanceolar, acuminate at both ends, one-celled, two-seeded, not opening at the sutures, but bursting longitudinally by a division passing down through both valves. (Macfadyen, *Flora of Jamaica.*)

Logwood is a native of Campeachy, but has been introduced into the West India Islands, as Jamaica, where it was carried in 1715. Royle says it has been taken to India. The inner-wood or heart-wood is the part used in the arts and in medicine. The sap-wood is removed.

Logwood comes into the market in billets several feet in length; the wood is reddish, hard, heavy, and of uniform grain. It has little or no smell, and an astringent, sweetish taste. It contains a volatile oil, *hæmatin*, tannin, &c. Hæmatin is the red colouring principle, obtained pure in a crystalline state.

Logwood is a mild astringent. The colouring principle is absorbed and colours the secretion of urine. As an astringent and roborant the drug is sometimes employed. It yields its virtues both to water and alcohol. The modes of exhibition are decoction, infusion, or extract. As a dye, Logwood is much used.

Plate XXV.—*Represents the plant in flower, the flower and fruit in different states of maturity.*

# CASSIA FISTULA.

## LINNÆUS.

## PURGING CASSIA.

CATHARTOCARPUS FISTULA.—*Persoon.*

SEX. SYST.—Decandria, Monogynia.

GEN. CHAR.—*Calyx* in five sepals, united at the base, and more or less unequal. *Stamens* ten, free, unequal; the three upper short, with abortive anthers, the lower ones longest. *Anthers* opening at the apex, with two pores. *Ovary* stipulate, usually arched. *Legume* compressed or otherwise. *Leaves* simply and abruptly pinnate; *leaflets* opposite. *Petioles* often glandulous.

Trees, shrubs, or herbs. The medical properties most common in the genus, are those of purgation. A tribe has, by some botanists, been made, called Cassieæ, and the species, now under consideration, separated by the generic name of *Cathartocarpus.*

SPECIF. CHAR.—A tree twenty to thirty feet high. *Leaves* pinnate, from twelve to eighteen inches long, deciduous. *Leaflets* from four to eight pair, opposite or nearly so; the lower broad, ovate; the upper oblong, entire, generally obtuse or emarginate, polished on both sides, from two to six inches long, and from one and a half to three broad. *Petioles* round, without glands. *Racemes* pendulous, simple, from one to two feet long. *Flowers* large, bright yellow, fragrant, on long, slender, smooth pedicels. *Sepals* five, nearly equal, oval, smooth, much shorter than the corolla. *Petals* oval, unequal. The three lower *filaments* much longer than the others, and having a double curve, but no swelling. *Anthers* on the three long filaments oblong, opening by two lines on the face; the other seven clavate, with pores at the small end. *Ovary* filiform, smooth, one-celled, containing numerous seeds, which at this period are without any sign of separation, that appearing in the advanced state; *style* short, incurved; *stigma* smooth, conical. *Legume* cylindrical, nine to twelve inches long, dark, blackish-brown, terete, smooth, blunt, filled with a viscid, black, sweetish pulp, interposed between the seeds and the transverse diaphragms. (*Lindley.*)

This plant is a native of India and Africa, but has been introduced into the West Indies. It grows well where the temperature is elevated.

The pods are imported on account of the pulp which they contain; this is soft, of a black colour, vinous odour, and sweet taste. It is extracted and used as a purgative, usually in combination with other substances, in the form of confections. One or two drachms prove laxative.

PLATE XXVI.—*Represents the leaves, flowers, and a section of fruit.*

# CASSIA LANCEOLATA.

## NECTOUX. DE CANDOLLE.

CASSIA ACUTIFOLIA.—*Delile.*

SEX. SYST.—Decandria, Monogynia.

GEN. CHAR.—See above.

SPECIF. CHAR.—A small undershrub, two or three feet high, with a straight, woody, branching, whitish stem. *Leaves* alternate and pinnate, with glandless footstalks, *Delile*, (glandular footstalks, *Nectoux*,) and two narrow-pointed stipules at base. The *leaflets* are sessile, in from four to six pairs, oval, lanceolate, acute, oblique at their base, nerved, from half an inch to an inch long, and of a yellowish-green colour. The flowers are yellow and in axillary spikes. The *fruit* is elliptical, obtuse, membranous, smooth, grayish-brown, bivalved, about an inch long and half an inch broad, scarcely curved, and divided into six or seven cells, each containing a hard, heart-shaped, ash-coloured seed.

This plant is the product of Upper Egypt, and is found near Sienna, in Nubia, Sennaar, and other portions of Africa. It was detected in the neighbourhood of the cataracts of the Nile.

CASSIA FISTULA.

CASSIA LANCEOLATA.

CASSIA OBOVATA.

P. SMITH, 144 CHESTNUT ST, PHILA.

Much difficulty exists in reconciling the discrepant statements of authors, with regard to this plant. The leaves of it certainly enter into the composition of Alexandrian Senna, and form the larger portion of it. By Linnæus two species of Senna were constituted, the *Senna Alexandrina foliis acutis*, and *Senna italica foliis obtusis;* the first is the plant under consideration, the second the *C. obovata*, next to be described; which also enters into Alexandrian Senna. Forskal in designating the acute-leaved Cassia, called it *C. lanceolata*. In this state information existed at the time of the invasion of Egypt by Bonaparte in 1798, who was accompanied by a corps of savans, among whom were Nectoux and Delile, who made the source of Senna an especial object of examination. They agree that they both met with the same acute-leaved plant, but have somewhat varied in their account of it. Nectoux calling it by Forskal's name, *C. lanceolata*, and Delile giving it that of *C. acutifolia*. The fact, that these two are synonymous, is to be settled by the statement of the writers themselves, to which De Candolle has assented; the causes of difference must be sought for in the variableness of characters, arising from soil, position, and physical influences, which are known to alter the characters of species. Forskal's plant, which was not very accurately described, has now been determined to be distinct, and by Royle described under the name of *C. Forskalii*. For a full discussion of this subject, see a paper in the eighth volume of the *American Journal of Pharmacy*, by the author.

The Alexandrian Senna is stated to be made of five parts of the acute leaflets, three parts of the obtuse, and two parts of argel.

There is another senna composed entirely of acute leaflets: this is the Tripoli Senna. Upon comparing the leaflets with similar ones in the Alexandrian, it will be found that no difference exists beyond what may be accounted for by physical influences. A new species has been made for it, however, called by Guibourt, *C. æthiopica*, and by Merat and De Lens, *C. ovata*. Guibourt informs us, that his plant is represented by Nectoux's, and Dr. Lindley states that the latter, as figured in Stevenson and Churchill's Medical Botany, is a good representation of that of Delile, so that we think there is good authority for concluding that this species is merely a variety.

Alexandrian Senna has a grayish-green colour, a peculiar odour, and a viscid, disagreeable taste. It contains an odorous principle, and a purgative principle, *Cathartin*. It is an active cathartic, operating with some pain and griping. It is given in a great number of forms. See *Pharmacopœia*.

PLATE XXVII.—*Represents the plant in flower, and the fruit.*

# CASSIA OBOVATA.

## COLLEDON.

SEX. SYST.—Decandria, Monogynia.

GEN. CHAR.—See *C. fistula*.

SPECIF. CHAR.—From a foot to a foot and a half high. *Stem* pubescent at base, cylindrical, branched. *Leaves* alternate, composed of from four to seven pairs of folioles; opposite, almost sessile, oboval, cuneiform, very obtuse, somewhat mucronate, thin below and inequilateral. They are slightly pubescent, of a yellowish-green colour, and having at the foot of the main stalk two subulate, entire, persistent stipules. The *flowers* are pale yellow, and are disposed in clusters upon the peduncles, which are axillary and longer than the leaves. The *pods* or *legumes*, which from their foliaceous appearance, have been erroneously named folliculi, are flattened, from twelve to fifteen lines long, and five or six broad; they are curved, so as almost to be reniform, and are of a greenish-brown colour. On each side are to be observed small transverse elevations, corresponding to the seeds, and covered with a minute pubescence, requiring the aid of a glass for detection. The *seeds* are black, heart-shaped, and not inaptly compared to the seeds of raisins.

This species is an inhabitant of Egypt, near to Cairo, Karnak, and Thebes. It is also found on the eastern bank of the Nile, near Hermonthis, and it grows in Nubia. It has been cultivated in Italy and Spain.

It is the *Cassia senna*, var. *foliis obtusis*, Linn. Willd. *Senna Italica*, Morrison. *Senna Belledy*, (*wild*,) Nectoux.

The leaves of Cassia obovata enter into the composition of Alexandrian Senna, and constitute three-fifths of the article. It is conjoined with *C. lanceolata vel acutifolia*, and *argel*.

PLATE XXVIII.—*Represents the plant in flower, and the legume.*

# CASSIA ELONGATA.

## LEMAIRE LISANCOURT.

CASSIA LANCEOLATA.—*Royle.*

SEX. SYST.—Decandria, Monogynia.

SPECIF. CHAR.—An annual, but with care it may be made to live through the year and assume a suffruticose habit. *Stem* erect, smooth. *Leaves* narrow, equally pinnated; *leaflets* four to eight pairs, lanceolate, nearly sessile, slightly mucronulate, smooth above, rather downy beneath, with veins turning inward and forming a flexuose intramarginal line; *petioles* without glands; *stipules* softly spinescent, semihastate, spreading, minute. *Racemes* axillary and terminal, erect, stalked, rather longer than the leaves; *pedicels* without bracts. *Sepals* linear, obtuse. *Petals* bright yellow. Of the *stamens*, the five lowest sterile and small, the two next large, curved, and perfect, the three uppermost minute and gland-like. *Ovary* linear, downy, falcate, with a smooth, recurved style. *Legumes* pendulous, oblong, membranous, about an inch and a half long, and five-eighths broad, quite straight, tapering abruptly to the base, and rounded at the apex, deep-brown, many-seeded. (*Lindley.*)

This plant affords the kind of *Senna* known as *India.* Some difficulty exists with respect to the botanical history, although there is so marked a character in the commercial article derived from it. Royle has given to it the name of *C. lanceolata*, which he has taken from Forskal's plant by giving to that the name *C. Forskalii.* We have shown that the plant described by Nectoux as *C. lanceolata* is the Egyptian species, the same as Delile's *C. acutifolia.* In admitting Royle's name of C. lanceolata, the species of Nectoux must be altered, as proposed by Guibourt and Merat and De Lens, for which we see no good reason. It is unfortunate, therefore, that Royle did not adopt the name of Lemaire, as Lindley has done, and then the India Senna would have been separated in his book from ambiguity. In the paper before referred to, (*Am. Journal of Pharmacy,*) we expressed the opinion that the species not named by Forskal, but described as the "Senna Meccæ Lohaiæ foliis, 5—7 jugis, lineari, lanceolatis," was the one affording India Senna. In this opinion we are glad to find that Dr. Lindley concurs.

The plant is found in Arabia and has been cultivated in India, the best kind known as Tinnivelly senna is to be referred to it. This article is active as a cathartic, and given in the same manner as the Alexandrian.

PLATE XXIX.—*Represents the plant in leaf, and the fruit.*

# COPAIFERA OFFICINALIS.

## LINNÆUS. JACQUIN.

COPAIFERA JACQUINI.—*Desfontaines.*

SEX. SYST.—Decandria, Monogynia.

GEN. CHAR.—*Calyx* four-parted; *segments* diverging, the lowest the narrowest. *Corolla* none. *Stamens* declinate. ten. *Ovary* roundish, compressed, with two ovules. *Fruit* pedicellate, oblique, obovate, rounded, compressed, between woody and leathery, two-valved, one-seeded. *Seed* inclosed in a one-sided aril. Trees or shrubs, inhabiting tropical America. Leaves alternate, pinnated, equally or unequally; *leaflets* opposite or alternate, either dotted or not. *Stipules* generally none. *Bracts* extremely fugacious. *Flowers* arranged in compound, axillary, and terminal spikes. (*Lindley.*)

SPECIF. CHAR.—This is a large, elegant tree, with alternate leaves, composed of from two to five pairs of sessile, oval leaflets, which are unequal-sided, obtusely-acuminate, entire, glabrous, a little shining, and marked with pellucid dots. The *flowers* are white, formed of axillary clusters, the length of the leaves.

This species is found in Venezuela, and the northern part of South America. It also grows in the West Indies.

CASSIA ELONGATA.

COPAIFERA OFFICINALIS.

MYROSPERMUM PERUIFERUM.

It affords some of the Copaiba of commerce, said not to be of the best sort. The best is that from Brazil. No less than thirteen other species of Copaifera afford the drug of commerce. The drug is obtained by making incisions into the stems of the trees; it then exudes abundantly, twelve pounds being sometimes procured in the space of a few hours. The old trees are said to furnish the fluid twice during the season, which is in the hottest months, and if a tree does not appear disposed to yield its product, the incision is immediately closed.

Copaiba is erroneously called a Balsam; it is not one of that class of substances, as it does not contain Benzoic acid; it rather belongs to the Turpentines. It is a clear, transparent, yellow-coloured fluid, having the consistence of olive oil, a peculiar odour, and a bitter, acrid taste. It contains volatile oil, and two resins, the yellow bitter resin, (*Copaivic acid,*) and brown soft resin. The former of these unites with bases, and forms solid copaivates. The Oil of Copaiba is isomeric with Oil of Turpentine.

Copaiba is a stimulant to the mucous surfaces; it acts decidedly as a diuretic, and impregnates, with its volatile portion, the secretion from the kidneys. It is used in mucous discharges, but more especially those from the genito-urinary apparatus. In large doses it is irritating to the stomach, and when absorbed in like amount acts violently on the kidneys and bladder. An eruption sometimes follows its use. The mode of administration is in mixture. pills, solidified, or capsules.

Plate XXX.—*Represents the plant in flower, and an enlarged flower and the fruit.*

# PAPILIONACEÆ.

Essential Char.—*Calyx* five-toothed, deciduous or persistent, sometimes bilabiate. *Corolla papilionaceous* or subpapilionaceous, with five petals inserted into the bottom of the calyx, usually free, sometimes united with one another, or with the stamens, imbricate. It is called papilionaceous, or *butterfly-shaped*, because one of the petals, the upper, is large and spreading,—the *vexillum* or banner,—two are lateral and resemble *wings*, *alæ*, and the two inferior are so united by the margin as to resemble the keel of a vessel, the *carina*. *Stamens* ten, inserted with the petals, united together, or nine united into a bundle and the tenth remaining free. *Ovary* free, placenta on one side. *Seeds* without albumen. *Embryo* curved, or bent back upon the cotyledons, rarely straight.

# MYROSPERMUM PERUIFERUM.

## DE CANDOLLE.

Myroxylon peruiferum.—*Linnæus.*

Sex. Syst.—Decandria, Monogynia.

Gen. Char.—*Calyx* campanulate, five-toothed, persistent. *Petals* five, the upper one largest. *Stamens* ten, free. *Ovary* stipitate, oblong, membranous, with two to six ovules; *style* towards the apex filiform, lateral. *Legume* with the stalk naked below but winged above, samaroidal, indehiscent, one-celled, one or two-seeded, laterally pointletted by the style. *Seed* besmeared with balsamic juice; *cotyledons* thick, plane. (*De Candolle.*)

Specif. Char.—This plant is described by Lambert in his Illustrations, from Ruiz's specimen. A tall, branching, and elegant tree. The *trunk* is thick, straight, smooth, covered like the branches with a gray, coarse, compact, heavy bark, granulated, and of a pale straw-colour in the interior; filled with resin, which, according as it abounds more or less, changes the colour to citron, yellow, red, or dark-chestnut. The *branches* extend almost horizontally. The *leaves* are alternate, and composed of two to five pairs of leaflets, nearly opposite, ovate, lanceolate, with the apex somewhat obtuse and emarginate, smooth; shining, entire, marked with transparent spots, hairy on the under surface, and with a short footstalk; many leaves terminate unequally. The common *petioles* are thickish and hairy. The *flowers* spring from the scars of the young branches, and from the axillæ of the leaves in single racemes larger than the leaves; *florets*

sparse, pedicellated, erect, supported by a small ovate, concave, flexible bract. The *calyx* is dark green, campanulate, divided into five small and nearly equal teeth, but one of them so far separated from the rest as to be found placed under the germen, and they all fall off when the flower withers.

The *corolla* is composed of five white petals, four of these narrow, equal, lanceolate, and larger than the calyx; the fifth reflexed, broad, and twice the size of the others. The *stamina* consist of ten filaments inserted into the calyx, and inclining to one side; the *antheræ* elongated, sharp-pointed, and sulcated. The *pistil* consists of an oblong germen, supported on a curved pedicle, inclining with the stamina to the same side; the *style* short, subulate and crooked, and the *stigma* simple.

The *pericarp* is pendulous, straw-coloured, nearly two inches in length, club-shaped, somewhat curved, globular near the top and terminated by the curved style; contracted towards the base, and compressed into the form of a rough tube, wrinkled, ductile, thick, furnished with two ribs or edges. The globular part is composed of a single cell, which contains one seed, which is crescent-shaped, projecting from the cell, and between this and the pericarp is filled with a yellow, liquid balsam, which in time dries and becomes as hard as resin.

The locality of this plant is the northern parts of South America, as Peru, New Granada, Colombia, and it is said Mexico. It grows in warm and sunny forests, flowering from August to October. Specimens of the plant were sent by Mutis to Linnæus, but after his death, and were described by his son in his Supplement, under the synonym as stated. Hernandez says that it was cultivated in the gardens by the monarchs of Mexico.

The juice constitutes Balsam of Peru. The tree is called by the natives of Peru *Quinquino.* The Balsam is procured by incisions at the beginning of the spring, when the showers are gentle, frequent, and short. If it be collected in bottles and well closed, it retains its fluidity for years; in this state it is called *Liquid White Balsam;* but when deposited in mats or calabashes, which is commonly done in Carthagena and the mountains of Tolu, after some time it condenses and hardens into resin, and is then denominated *Dry White Balsam* or *Balsam of Tolu.* (*Ruiz.*)

If the bark be boiled in water and made into a fluid extract, it constitutes the Black Peruvian Balsam.

Richard has made another species, the M. Toluiferum, to furnish the Balsam of Tolu; this may be so, or it may be a variety. The identity of the Dry White Balsam, and that of Tolu would seem to favour the latter supposition. The distinction has been made from the leaves of a specimen in Humboldt's Herbarium.

Balsam of Peru has an aromatic, pleasant odour, and a warm taste; it contains two resins, an oil, (*cinnaméine,*) benzoic (*cinnamomic*) acid, and extractive, from the analysis of Stolze.

This drug is a stimulant, tonic, expectorant, &c. It is used in diseases of mucous surfaces, and as an epulotic in ulcers and sores.

The common article is not generally used internally. The dry is soluble in alcohol, hence the use of the Tincture, and its conversion into Syrup.

PLATE XXXI.—*Represents the plant in flower, an enlarged flower, and the legume and seed.*

# GLYCYRRHIZA GLABRA.

## LINNÆUS.

## COMMON LIQUORICE.

SEX. SYST.—Diadelphia, Decandria.

GEN. CHAR.—*Calyx* naked, tubular, five-cleft, bilabiate, with the two upper lobes united more than the others. *Vexillum* ovate, lanceolate, straight; *keel* two-petalous or two-parted, straight acute. *Stamens* diadelphous. *Style* filiform. *Legume* ovate or oblong, compressed, one-celled, one to four-seeded. Perennial herbaceous plants, with extremely sweet roots. *Leaves* unequally pinnated. *Racemes* axillary. *Flowers* blue, white, or violet. (*Lindley.*)

SPECIF. CHAR.—*Root* cylindrical, running to a considerable length and depth, bright brown on the outside, yellow inside, soft and succulent. *Stem* erect, two feet high, smooth, of a dull, glaucous, gray colour. *Leaves* pinnate; *leaflets*

GLYCYRRHIZA GLABRA.

ASTRAGALUS VERUS.

generally about thirteen, oval, entire, obtuse, slightly emarginate, viscid; stipules inconspicuous. *Flowers* pale lilac, in axillary, erect, stalked racemes. *Legumes* compressed, smooth. (*Lindley.*)

This plant is a native of the south of Europe. It flourishes in Spain, Italy, &c. Also in Syria at the foot of Mount Caucasus, (*Royle,*) and is cultivated in England and France.

The root, which is called Liquorice Root, is in long pieces, about the thickness of the finger, of a grayish-brown colour externally, but when divested of the epidermis, of a yellow colour. Its odour is feeble, but its taste sweet and mucilaginous. The fresh root, according to Robiquet, contains *Glycyrrhizin*, starch, asparagin, resinous oil, albumen, woody fibre, and salts.

As a medicine it is used for its demulcent and sapid properties. It is generally employed in affections of the lungs, in combination with expectorants. The preparations are decoction, extract, and troches.

PLATE XXXII.—*Represents the plant in flower, and the fruit.*

# ASTRAGALUS VERUS.

## OLIVIER.

## MILK VETCH.

SEX. SYST.—Diadelphia, Decandria.

GEN. CHAR.—*Calyx* five-toothed. *Corolla* with an obtuse keel. *Stamens* diadelphous. *Legume* two-celled, or half two-celled, in consequence of the dorsal suture being turned inwards. Herbs or shrubs. (*De Candolle,* who named the genus.)

SPECIF. CHAR.—A small shrub. *Branches* covered with imbricated scales and spines, the remains of former petioles. *Leaves* pinnate; *leaflets* eight to nine pairs, linear, trispid; *stipules* at first downy, then smooth. *Flowers* yellow, papilionaceous, in axillary clusters, of two to five, sessile.

This plant is a native of Persia and contiguous countries, as Asia Minor and Armenia. According to Olivier, the greater part of the Tragacanth of commerce is obtained from it. The *A. gummifera*, and *A. creticus*, and other species, are also said to yield it.

Tragacanth exudes either naturally or from wounds. De Candolle explains its exudation in the following way, which applies to all gum-producing plants. "The gummy matter resides in the bark and albumen; it is the nutritive juice of the plant; and its escape, therefore, is analogous to hemorrhage from animals: hence plants from which it spontaneously occurs are always in a sickly state. The mechanical cause of the expulsion of this juice is dependent on the unequal hygrometrical properties of the different parts of the stem. The wood absorbs more moisture from the air than the bark, hence it swells more. In consequence of its enlargement, it distends the bark, which, by the internal pressure of the wood, gives way, and the gummy matter escapes." According to La Billardière, the Tragacanth flows only in abundance during the night, and a little after sunrise, which, as remarked by Pereira, makes the facts accord with the explanation.

There are several varieties of Tragacanth. It occurs in broad or thin pieces, twisted and striated, and is imported originally from the eastern ports of the Mediterranean.

It contains *tragacanthin*, *bassorin*, and *starch*.

This article of the Materia Medica is demulcent and nutritive. It is said to be difficult of digestion. It is used as a vehicle for other medicines, in troches, and in the form of mucilage.

PLATE XXXIII.—*Represents the plant in flower.*

# ROSACEÆ.

## JUSSIEU.

Essential Char.—*Calyx* generally of five sepals, cohering at the base to form a tube; therefore five-lobed, generally persistent, usually free, sometimes adherent to the ovary. *Petals* as many as the sepals, rarely by abortion none, inserted on the calyx, quincuncial in æstivation, generally regularly. *Stamens* inserted with the petals, mostly indefinite; *filaments* incurved in æstivation; *anthers* two-celled, dehiscing by a double chink. *Carpels* numerous, either solitary by abortion, or having the appearance of a single ovary, from their union, either together or with the tube of the calyx. *Ovaries* one-celled; *styles* simple, dilated at the apex into stigmas of variable shape, usually arising from the side of the ovary, either distinct, or more rarely coherent. *Seeds* in each carpel usually one or two, seldom numerous, erect or inverse, exalbuminous. *Embryo* straight; *cotyledons* either foliaceous or fleshy.

Herbs, shrubs, or trees. *Leaves* alternate, bistipulate at base, simple or compound. (*De Candolle.*)

This family is subdivided into orders, which differ as regard the proximate principles predominating in them. They are decidedly marked, however. Thus the Roseæ are astringent, the Spirææ emetic, and the Amygdaleæ sedative.

# SPIRÆÆ.

*Calyx* campanulate, imbricate, or valvate in æstivation. *Carpels* mostly five or less, verticillate, follicular, or two-valved in fruit; *styles* terminal. *Seeds* one to eight or ten in each carpel, pendulous or ascending. (*Gray* and *Torrey* in *Flora of North America.*)

# GILLENIA TRIFOLIATA.

## MOENCH.

## INDIAN PHYSIC.

Sex. Syst.—Icosandria, Pentagynia.

Gen. Char.—*Calyx* subcampanulate, border five-toothed. *Corolla* partly unequal. *Petals* five, lanceolate, attenuated, coarctate at the claws. *Stamina* fewer, included. *Styles* five, contiguous. *Stigmas* capitate. *Capsule* five-celled; *cells* two-seeded. (*Nuttall.*)

Specif. Char.—*Leaves* ternate, upper folioles lanceolate, serrate, subequal, lower folioles obtuse, with an abrupt, obtuse termination. *Stipules* linear, entire. *Flowers* terminate, loosely paniculated, five-gynous. *Petals* linear, lanceolate, obtuse. *Calyx* tubulose, campanulate, ventricose. *Stamina* included. *Capsule* five-celled, many-seeded.

This plant is the *Spiræa trifoliata* of Linnæus, but the generic name was altered to the present one by Moench. The common names are *Indian Physic*, *Indian Hippo*, *Dropwort*, and *Bowman's Root.*

This species is found diffused over the United States from Maine to Florida, on the eastern side of the Alleghany mountains, occurring in open hilly woods, in light gravelly soil. The period of flowering is May, and the fruit is matured in July. The flowers are white or of a rose tint.

The *root* is perennial, composed of a great number of fibres, arising from a common rough and irregular dark-

GILLENIA TRIFOLIATA

TERASUS SEROTINA.

coloured tuber or head. These fibres are about the thickness of straws, many inches in length, irregular in thickness, with somewhat of an undulated form. When dried they are of a reddish-brown colour, wrinkled and compressed, of an easily separable cortical portion, and an internal ligneous cord. The external part is easily reduced to powder. It has a feeble odour and a bitter taste.

Some experiments upon the root of Gillenia trifoliata have been made by Mr. Shreeve, (*Am. Journ. of Pharmacy*, vol. vii.,) who found that it contained starch, gum, resin, wax, fatty matter, red colouring matter, volatile colouring matter, and *a peculiar principle*, soluble in alcohol and the dilute acids, but insoluble in water and ether. It contains no *emetina* according to the statement of Dr. Staples.

Gillenia is a safe emetic, operating without violence in the appropriate dose. In small doses it is stimulant and tonic to the stomach. It is stated that a knowledge of its medicinal operation was derived from the Indians. It is used wherever it becomes necessary to evacuate the stomach, and has been regarded by some practitioners as nearly equal to ipecacuanha. It is given in the form of powder, the dose being about 3ss., or in that of strong infusion. Two or three grains act as a tonic.

PLATE XXXIV.—*Represents the plant in flower, the structure of the flower and fruit.*

# AMYGDALEÆ.

## JUSSIEU.

ESSENTIAL CHAR.—*Calyx* free from the ovary, deciduous. *Ovary* solitary, with two collateral, suspended ovules; *styles* terminal; *stigma* reniform or emarginate. *Fruit* a drupe. *Seed* mostly solitary, suspended in consequence of the cohesion of the funiculus with the side of the cavity of the ovary. (T. and G., in *Flora of N. A.*)

Trees or shrubs, confined to cold or temperate climates, with simple leaves, which are commonly glandular towards the base. *Stipules* free. *Fruit* eatable; the bark yielding gum; and the leaves, bark, and kernel containing tannin and amygdalin.

# CERASUS SEROTINA.

## DE CANDOLLE.

## WILD CHERRY.

SEX. SYST.—Icosandria, Monogynia.

GEN. CHAR.—*Calyx* hemispherical, the limb five-parted, regular, deciduous. *Petals* much spreading. *Stamens* fifteen to thirty. *Drupe* globose, or umbilicate at the base, fleshy, quite smooth or covered with a pruinose powder. *Nucleus* (stone) somewhat globose, smooth. *Young leaves* conduplicate. *Pedicels* one-flowered or racemose.

SPECIF. CHAR.—*Leaves* rather coriaceous, oval oblong, acuminate, glabrous, or bearded along the midrib beneath, smooth and shining above, finely serrate, with adpressed or incurved, callous teeth; *petioles* (or base of leaf) mostly with two or more glands; *racemes* elongated, spreading; *petals* broadly obovate; *drupes* globose, purplish black. (T. and G., *Flora of N. A.*)

The *Wild Cherry* is an inhabitant of the United States, from Maine to Louisiana. It varies in height from twenty to eighty or more feet, attaining its extreme proportions in the southwestern portion of the Union. The *leaves* are from two to four inches long; the *racemes* two to five inches in length, and nodding at their termination. The *flowers* are pure white, fragrant, and appear in May, the *fruit* ripening in August. The bark of the tree is of a dark ashy hue on the trunk, where it is rough; smooth and dark upon the branches. The epidermis is readily separable, and peels off circularly when detached, leaving the green cellular tissue beneath. By this character it can

be detected in the forests. The wood is hard, and valuable in the construction of furniture. The fruit has a sweet, somewhat prussic, and slightly bitter taste. It is used for flavouring liquors.

Not a little confusion has existed among botanists with respect to the name of this tree, from its having been confounded with a species closely allied to it, the *C. virginiana* of De Candolle, or *Choke Cherry*. The latter was described by Linnæus as *Prunus virginiana*, which name was changed to *Cerasus virginiana* by Michaux, under the impression that the *Wild Cherry* was referred to by Linnæus. To the *Choke Cherry* the name of *C. serotina* was given by botanists, thus completely reversing the names. The error was corrected by De Candolle, and has been fully explained in Torrey and Gray's Flora of North America. The designation at the head of our chapter is the true one.

The bark of the branches or of the root is employed for medicinal purposes. The latter is regarded as best. It is collected and brought into the market in pieces or fragments several inches long, and from half an inch to two wide, curved laterally. The colour is reddish-brown, when free from epidermis; it is brittle and pulverizable, having a short fracture with grayish surfaces. When fresh, the odour is prussic, which in a measure is lost by drying, and regained by maceration. The taste is aromatic, prussic, and bitter.

The first satisfactory analysis of this bark was made by Dr. Procter, (*Journ. of Phil. Col. of Pharm.*, vol. vi. p. 8.,) who found it to contain starch, resin, gallic acid, tannin, fatty matter, lignin, red colouring matter, salts of lime, potassa, and iron. By distilling the bark with water a *volatile oil* was obtained, associated with hydrocyanic acid. More recently, (*op. cit.*, vol. ix. p. 300, and x. p. 197,) Prof. Procter has shown that the oil and acid do not exist in the bark, but are due to the decomposition of the *amygdalin* in it.

The medical properties are those of a tonic and sedative in union. It is used in convalescence with restlessness, in phthisis, &c. It is given in powder, cold infusion, and syrup.

Plate XXXV.—*Represents the plant in flower, the dissected flower and the fruit.*

# MYRTACEÆ.

## R. BROWN.

## MYRTLE TRIBE.

Essential Char.—*Sepals* four to six, generally five, concreted into a tube, which is adnate to the ovary, sometimes distinct at the apex, and as far as the margin of the ovary; at other times concrete at the apex, and as far as the throat. *Petals* inserted on the calyx, as many as the sepals, with which they alternate, and quincuncial in æstivation, very rarely absent. *Stamens* inserted with the petals, often in many rows, double, or generally many times the number of the petals; *filaments* either free, or variously all connected, or polyadelphous, before flowering somewhat incurved; *anthers* ovate, bilocular, small, dehiscing by a double chink. *Carpella* four to six, generally five, by abortion often fewer, concrete into a many-celled ovary, which is adnate to the calyx. *Style* composed of many partial styles concreted, and, therefore, called single, with a simple stigma. *Fruit* various, many-celled, many-seeded. *Seeds* various; *embryo* exalbuminous. (*De Candolle.*)

Trees or shrubs, with leaves generally opposite, rarely alternate, exstipulate, quite entire, dotted with pellucid glands, and usually with a vein running parallel with their margin. *Inflorescence* variable, usually axillary. *Flowers* red, white, occasionally yellow, never blue. (Pereira, *Mat. Med.*)

The medical properties pertaining to the Myrtaceæ are due to volatile oil and tannin.

EUGENIA PIMENTA.

# EUGENIA PIMENTA.

## DE CANDOLLE.

## ALLSPICE.

MYRTUS PIMENTA.—*Linnæus.*

SEX. SYST.—Icosandria, Monogynia.

GEN. CHAR.—Tube of the *calyx* roundish; *limb* divided, as far as the ovary, into four segments. *Petals* as many as the lobes. *Stamens* indefinite, free. *Ovary* two or three-celled; *cells* containing many ovules. *Berry* nearly globose, crowned by the calyx; when ripe, one, rarely two-celled. *Seeds* one or two, somewhat rounded, large; *embryo* spuriously monocotyledonous; *cotyledons* very thick, combined into one mass; *radicle* scarcely distinct, very short. (*De Candolle.*)

SPECIF. CHAR.—A tree about thirty feet high. *Branches* terete; *branchlets* compressed; the younger ones, as well as the pedicels, pubescent. *Leaves* about four inches long, on short footstalks, oblong or oval, pellucid-dotted, somewhat opaque, smooth. *Flowers* numerous, four-cleft in the forks of the peduncle, nearly sessile; others pedunculate. *Sepals* roundish. *Petals* reflected, greenish-white. *Berry* succulent, black or dark-purple when ripe, two-seeded. *Embryo* roundish, with cotyledons consolidated. (Pereira, from *De Candolle* and *Botanical Magazine.*)

The Pimenta plant is a native of the West Indies and South America. It is cultivated in Jamaica: hence the name Jamaica Pepper. It is a plant which cannot, however, be indiscriminately propagated by planting, and the only method of forming a "Pimenta Walk" is to level the forest in the neighbourhood of a plantation, and allow the berries to be scattered over the ground by the birds; the decaying timber upon the ground affording protection and nourishment to the young trees after they have sprouted. Soon after the trees are in blossom, the berries become fit for gathering. The fruit is not suffered to ripen on the tree, as the pulp in that state, being moist and glutinous, is difficult to cure. It is gathered by hand, then exposed upon a terrace, and dried by the sun. The returns are large, a single tree affording one hundred pounds of cured fruit.

The berries, called Allspice, are a little larger than pepper, round, unequal, and rugose, of a brownish colour, and marked with an umbilicated prominence; they are separable into two reniform cells, each containing a black seed. The smell is aromatic and agreeable, resembling several spices, hence the name Allspice; their taste is astringent, warm, and aromatic. By time they deteriorate. They impart their properties partially to water, and entirely to alcohol. They contain a warm, fragrant, heavy, volatile oil, which is of a reddish-brown colour. Bonastre, also, obtained a green fixed oil, a flaky substance, tannin, gum-resin, uncrystallizable sugar, malic acid, and colouring matter.

Pimenta is a warm aromatic stimulant, generally employed as an adjuvant. It is used in substance, in infusion, or distilled water, or spirit.

PLATE XXXVI.—*Represents the plant in flower.*

# CARYOPHYLLUS AROMATICUS.

## LINNÆUS.

## CLOVE TREE.

EUGENIA CARYOPHYLLATA.—*Thunberg.*

SEX. SYST.—Icosandria, Monogynia.

GEN. CHAR.—Tube of the *calyx* cylindrical; *limb* four-partite. *Petals* four, adhering by their points in a sort of calyptra. *Stamens* distinct, arranged in four parcels, inserted in a quadrangular, fleshy hollow near the teeth of the

calyx. *Ovary* two-celled, each cell containing twenty ovules. *Berry*, when ripe, one or two-celled, one or two-seeded. *Seeds* cylindrical or semi-ovate; *cotyledons* thick, fleshy, concave externally, sinuous in various ways internally; *radicle* arising from the centre of the cotyledons, straight, superiorly hidden by the cotyledons. (*De Candolle.*)

Specif. Char.—A moderately-sized tree, of a conical form, with opposite, more or less virgate branches. The whole plant is glabrous. *Leaves* opposite and decussate, persistent, somewhat coriaceous and shining, minutely punctated, about four inches long, ovate lanceolate, more or less acute, quite entire, pale beneath, tapering gradually at the base into a slender footstalk, which is about two inches long. *Panicles* short, terminal, of many flowers, and always trichotomously divided, jointed at each division. *Peduncles* terete, green. *Calyx* of four ovate, concave segments, erecto-patent, placed on the top of the ovary, and together with it first green, then red, coriaceous. *Petals* four, larger than the calyx, imbricated into a globe in bud, at length spreading, roundish, concave, yellowish-red, very soon caducous. In the centre of the calyx, and occupying the top of the ovary, is a quadrangular elevated line or *gland*, surrounding, but not embracing, the base of the shortish, obtusely-subulate style. Around this gland, immediately within the petals, the *stamens* are inserted, but as their insertion does not extend to the angles of the gland, they appear to be collected into four bundles, numerous. *Filaments* much longer than the petals, yellow. *Anthers* ovate, cordate, yellow, two-celled. *Ovary* oblong, or almost cylindrical, two-celled, with many small ovules in each cell attached to the sides of the dissepiment. All these become abortive, or one proves fertile, and by its great enlargement destroys the appearance of the rest of the ovules, and of the second cell; so that the fruit, which forms a rather large elliptical purple berry, is only one-seeded; this is also of the same shape as the berry; its integument thin, and of a soft texture. *Embryo* likewise elliptical, large, greenish, fleshy, dotted. *Cotyledons* unequal, sinuose, the larger one partly enveloping the smaller, including the superior radicle. (Lindley, from *Botanical Magazine.*)

The Clove Tree was originally confined to the Moluccas, where it was an article of importance when these islands were in the possession of the Portuguese. The smaller islands produced the best. It is not possible to indicate the precise period at which Cloves were known in Europe; the Chinese, who visited the Moluccas before their discovery by Europeans, distributing the spice throughout India, whence it was carried to Persia, Arabia, and finally to Europe. The Dutch having obtained possession of the Moluccas from the Portuguese in 1599, allowed the plant to grow only in Amboyna and Ternate. This step, which had for its object the possession of a monopoly, was unsuccessful. It did not prevent its introduction into the French East India Islands, whence it was taken to the West Indies. In 1769 the Clove was taken to the isle of Bourbon, through the instrumentality of M. Poivre. The best Cloves, however, come from the Moluccas.

The tree is propagated by the *mother cloves*, (ripe fruit,) or by transplanting the young trees found in the clove gardens. Great care and industry are requisite in the culture of cloves, for, if neglected, they are apt to degenerate into *wild cloves*. In seven or eight years the trees will bear, and continue to do so for near a century. The mode of collecting cloves is as follows: when the buds commence to grow red, the reaping is commenced; the ground underneath is swept clean; the nearest clusters are taken off with the hand, and the more distant with the assistance of crooked sticks, and great care is taken not to injure the trees. The cloves are then placed on hurdles, where they are smoked with a slow fire, which gives to them a brown colour; they are then dried in the sun. Such cloves as fall upon the ground spontaneously, whence they are collected, are of inferior quality and become shrivelled.

The average of each tree is five pounds, and sometimes a single tree may yield one hundred pounds. They are introduced into commerce in bags containing several hundred weight, and in mass suffer no deterioration. (Crawfurd's *East Indian Archipelago.*)

Cloves are the unexpanded flower-buds, consisting of the flowers and fruit not developed. They have the form of a tack, are of a reddish-brown colour, with an aromatic strong odour, and a warm, biting, aromatic taste. To be good they should be full-sized, heavy, easily broken, and when pressed with the fingers afford oily matter. They contain extractive, astringent matter, volatile oil, resin, gum, a sub-resin, to which Prof. Lodibert has given the name *Caryophylline*, and an aromatic, green, fixed oil.

Of the aromatics, cloves are among the most powerful. As an excitant they require some caution in their administration, as an overdose, even of the infusion, will affect the head, producing vertigo, dizziness, and headache. Their general use is as an adjuvant. They are given in powder, infusion, &c.

Plate XXXVII.—*Represents the plant in bud and in flower, with the fruit.*

EUGENIA CARYOPHYLLATA.

PUNICA GRANATUM.

# PUNICA GRANATUM.

## LINNÆUS.

## POMEGRANATE.

Sex. Syst.—Icosandria, Monogynia.

This genus has been placed in a separate order, *Granateæ*, by Mr. Don. Dr. Lindley, however, treats of it as a portion of the Myrtaceæ.

Gen. Char.—*Calyx* turbinate, five to seven-cleft, æstivation valvate. *Petals* five to seven. *Stamens* numerous; *filaments* distinct. *Style* filiform. *Stigma* capitate. *Fruit* large, globose, crowned by the somewhat tubular limb of the calyx, baccate, indehiscent, covered with the tube of the calyx, divided horizontally into two parts by a very irregular confused dissepiment; the lower division three-celled, the upper five to nine-celled; *dissepiments* membranaceous; *placentæ* in the lower division at the bottom; in the upper stretching from the side of the fruit to the middle. *Seeds* numerous, nestling in the pellucid pulp. *Embryo* oblong; *radicle* short, acute; *cotyledons* foliaceous, spirally convolute.

Small trees or shrubs, with spinescent branchlets. *Leaves* deciduous, opposite, rarely verticillate or alternate, often axillary and fascicled, oblong, quite entire, not dotted. *Flowers* two to three, nearly sessile, on somewhat terminal branchlets, usually scarlet. (*Wight* and *Arnott*. *Lindley*.)

Specif. Char.—*Stem* arborescent, (fifteen to twenty feet high,) and irregular, in arid situations rather thorny, the *leaves* usually opposite, often fascicled, oblong, inclining to lanceolate, quite entire, not dotted, smooth, shining, and of a dark-green colour; *flower* commonly solitary, of a brilliant scarlet colour; *calyx* thick and fleshy, adhering to the ovary, turbinate, five to seven-cleft; *petals* five to seven, crumpled; *stamens* numerous, often double; *style* filiform; *stigma* capitate; *fruit* of the size of a large apple, with a thick, leathery rind, and crowned with the tubular limb of the calyx; *cells* several, arranged in two strata, separated from each other by an irregular transverse diaphragm; lower division of three cells, the upper of from five to nine cells; *seeds* numerous, involved in pellucid pulp, with foliaceous, spirally-convolute cotyledons. (Royle, from *Nees Von Esenbeck*.)

The Pomegranate has been known from a very early period, and the several parts of it employed for a number of purposes. It is said, originally, to have come from Africa, the generic name Punica being significant of its Carthaginian origin. By the Romans it was called "Malum Punicum." The specific name originated from the immense number of seeds which it contains. The plant is now found abundantly in Europe and Africa, on both sides of the Mediterranean, in Syria, India, China, and in America, wherever the climate is mild enough for its growth. The flowers are called *balustine* flowers (*flores balustiæ*); they are odourless, of a fine red colour, and styptic taste; they communicate a reddish colour to the saliva.

The rind of the fruit (malicorium) is tough and membranous; when dry, it is of a dark brownish-yellow colour, brittle, odourless, and very styptic. The seeds in the fresh state are acidulous and astringent, from the juice contained in vesicles surrounding them. They are of a beautiful red, shining through the transparent juice. The root is woody, knotty, hard, heavy, of a yellow colour, and astringent taste.

The bark is of an ashy hue, brittle, fibrous, and astringent.

All these portions contain *tannin* in abundance, resin, extractive, and in the root a peculiar principle called *granadin*. This has been shown to be identical with mannite. There appears to be no difference between the wild and the cultivated plant.

The medical properties of all portions of the Pomegranate which are used, are of an astringent and tonic nature. As a remedy in tænia, the root-bark is sometimes directed. The powder of each part employed is sometimes given, or an infusion or decoction is prepared.

Plate XXXVIII.—*Represents the plant in flower, the dissected flower, and the fruit.*

# CUCURBITACEÆ.

## JUSSIEU.

## THE GOURD TRIBE.

Essential Char.—*Flowers* usually unisexual, sometimes hermaphrodite. *Calyx* five-toothed, sometimes obsolete. *Corolla* five-parted, scarcely distinguishable from the calyx, very cellular, with strongly-marked, reticulated veins, sometimes fringed. *Stamens* five, either distinct, or cohering in three parcels; *anthers* two-celled, very long, and sinuous. *Ovary* inferior, one-celled, with three parietal placentæ; *style* short; *stigmas* very thick, velvety or fringed. *Fruit* fleshy, more or less succulent, occasionally dry, opening by valves covered by the scar of the calyx, one-celled, (in some Momordicas, three or four-celled,) with three parietal placentæ. *Seeds* flat, ovate, enveloped in an aril, which is either juicy, or dry and membranous; *testa* coriaceous, often thick at the margin; *embryo* flat, with no albumen; *cotyledons* foliaceous, veined; *radicle* next the hilum. *Roots* annual or perennial, fibrous or tuberous. *Stem* succulent, climbing by means of tendrils formed by abortive leaves, (stipules, *St. Hilaire.*) *Leaves* palmated, or with palmated ribs, very succulent, covered with numerous asperities. *Flowers* white, red, or yellow. (*Lindley.*)

The medical properties of this tribe of plants are varied. Some of them are esculent, with a tendency to act upon the kidneys, while others again are active upon the bowels, and possess insufferable bitterness. Peculiar proximate principles have been discovered in some of them, as, *colocynthin* in the colocynth, *elaterin* in the elaterium, and *bryonin* in the bryony.

# CITRULLUS COLOCYNTHIS.

## ROYLE.

## BITTER CUCUMBER.

Cucumis colocynthis.—*Linnæus.*

Sex. Syst.—Monœcia, Monadelphia.

Gen. Char.—*Corolla* persistent, five-parted, subrotate. *Anthers* triadelphous. *Style* trifid. *Stigma* obcordate. convex. *Fruit* a fleshy, or dry and fibrous, many-seeded peponida. (Necker, *Griffith's Med. Bot.*)

Specif. Char.—*Stem* prostrate, hispid. *Leaves* cordate, ovate, many-lobed, white with hairs beneath; the *lobes* obtuse; *petioles* as long as the lamina. *Tendrils* short. *Flowers* axillary, solitary, stalked; *females*, with the tube of the calyx globose, and somewhat hispid; the *limb* campanulate, with narrow segments. *Petals* small. *Fruit* (*pepo*) globose, smooth, size of an orange, yellow when ripe, with a thin, solid rind, and a very bitter flesh. (*De Candolle.*)

This plant is found in warm climates, in sandy soil. It is an inhabitant of Egypt, Nubia, Palestine, Turkey. Coromandel, and the Greek Islands. It is not, however, confined to these countries, but is cultivated in others propitious to it.

The pulp of the fruit is used in medicine. It is arranged in a cancellated form, and contains a great number of ovate, acute, compressed seeds, of a brown colour.

The plant is supposed to be the "wild vine" mentioned in 2 Kings, iv. 39, of the Old Testament, (*Pereira.*) It was known to the Greeks and Romans. Although the pulp and pericarp of the seeds are bitter, the interior of the seeds is mild, oily, and nutritious. Captain Lyon informs us that the interior substance of the seeds is an article of diet in North Africa.

Plat. XLI

CITRULLUS COLOCYNTHIS.

MOMORDICA BALSAMINA.

The fruit is gathered in autumn and is *peeled* or *unpeeled*, the first is *Turkey* Colocynth, the latter *Mogadore*. It is dried in the sun. The pulp is separated from the seeds for use. It is light, spongy, of a white colour, difficult to pulverise, destitute of odour, and of an intensely bitter taste. It contains, in connexion with other matters, a peculiar principle, *colocynthin*, a bitter resinoid matter.

Colocynth is a cathartic, possessing power in proportion to the dose; in moderate doses it is safe and effectual, quickening the peristaltic movements of the intestines. In larger doses it purges, and in overdoses is so violent as to produce inflammation and its attendants. It is usually given in the form of extract, either simple or compound.

PLATE XXXIX.—*Represents the plant in flower, and the pepo or fruit.*

# MOMORDICA ELATERIUM.

## LINNÆUS.

## SQUIRTING CUCUMBER.

ECBALIUM ELATERIUM.—*Richard.*

SEX. SYST.—Monœcia, Syngenesia.

GEN. CHAR.—*Flowers* monœcious, yellow or white. *Male: Calyx* five-cleft, with a very short tube. *Corolla* five-parted. *Stamen* triadelphous, with connate anthers. *Female: Filaments* three, sterile. *Style* three-fid. *Ovary* three-celled. *Fruit* opening with elasticity when ripe. *Seeds* compressed, reticulate. (*Lindley.*)

SPECIF. CHAR.—*Root* annual. *Stem* thick, round, short, trailing and branching, hispid, without tendrils. *Leaves* cordate, angulated, obtuse, crenate, dentate, rugose, grayish, and strongly reticulated on the under side; *petioles* long and bristly. *Flowers* axillary; the males form racemes of five or six flowers. *Calyx* adherent, with five lanceolate, acute teeth. *Corolla* campanulate, yellow, reticulated with green veins. *Males: Stamina* three, two of which bear doubly-folded anthers, (or five, four of which cohere, so as to form two bundles of two anthers each.) *Females: Filaments* three, sterile; *ovarium* inferior, one-celled, (spuriously called three-celled;) *style* simple; *stigmas* three, bifid. *Pepo* small, elliptical, pedunculated, grayish-green, covered with soft prickles; when ripe, separating from its stalk, and expelling with considerable violence its brown seeds, and a thin mucus, through the aperture at the insertion of the stalk. (*De Candolle* and *Pereira.*)

The plant under consideration is a native of the south of Europe. It is cultivated in England and the United States. Where indigenous, it grows in waste places.

It has derived its name of Squirting Cucumber, from the power the fruit has of expelling the juice. Dr. Dutrochet's attention was directed to this circumstance, and explained by him upon the principle of endosmosis. It appears that the seeds in the centre of the fruit are surrounded by a membranous, elastic sac, containing thick mucus. This mucus attracts moisture from the surrounding substance during the growth of the fruit, until it becomes turgid from distension. When a point of the sac is weakened by withdrawal of external support, as by the removal of the peduncle, it collapses with a force proportioned to its elasticity, and a jet takes place, carrying the mucus, seeds, and fluid.

The green, thick mucus, when viewed with the microscope, appears to consist of small globules, agglomerated confusedly, or in irregular striæ, swimming in a thinner fluid, of a white colour. Dr. Clutterbuck found that the activity of the fruit resided in the mucus in contact with the seeds; hence he adopted a method of obtaining it, by allowing the fluid, (obtained by slicing the fruit and placing it on a sieve to drain through,) to stand until a whitish feculent matter was precipitated. This, when dried, constitutes Clutterbuck's Elaterium; only six grains were obtained from forty cucumbers.

The best Elaterium of the shops, (*English Elaterium,*) is procured by allowing the juice, (obtained by slicing and gentle pressure,) to stand until the thicker portion subsides, then decanting the thinner, and evaporating. The commonest is procured by evaporating the entire quantity of juice. Dr. Pereira states that "If the juice of one of the fruits be received on a plate of glass, it is at first nearly colourless and transparent. In a few minutes, however, by

exposure to the air, it becomes slightly turbid, (milky,) and small white coagula are formed in it. By slow and spontaneous evaporation, crystals of a rhomboidal figure are perceptible on the glass when examined by a magnifier. These crystals are *elaterin*. They are probably formed by the influence of the air on the juice."

The best Elaterium occurs in small flat cakes, bearing the impression of muslin on which dried. It has a pale grayish-green colour; its odour is disagreeable, and its taste acrid and bitter. Inferior qualities of the drug are dark-brown, or olive-green.

Elaterium contains *elaterin*, *green resin*, and bitter matter.

Elaterium is a powerful hydragogue cathartic, producing copious watery discharges from the bowels. In overdoses it acts violently. Its activity may be judged of from the dose, which of the finer kinds is one-eighth to one-fourth of a grain. It is given in pill with a bitter extract, as that of gentian.

PLATE XL.—*Represents the plant in flower, and the fruit.*

# UMBELLIFERÆ.

## JUSSIEU.

## UMBELLIFEROUS TRIBE.

APIACEÆ.—*Lindley.*

ESSENTIAL CHAR.—Tube of the *calyx* adherent to the ovary; the *limb* (superior calyx of Lindley) entire, or five-toothed or obsolete. *Petals* five, inserted into the upper part of the calyx, (inserted on the outside of a fleshy epigynous disc, *Lindley*,) usually inflexed at the point; *æstivation* imbricate, rarely valvate. *Stamens* five, alternate, with the petals incurved in æstivation. *Ovary* (inferior, Lindley,) adherent to the calyx, two (rarely) one-celled, with solitary pendulous ovules; *styles* two, distinct, incrassated at the base into *stylopodia*, covering the whole of the ovarium; *stigmas* simple. *Fruit*, (called *diachænia*, *polyachænia*, or *cremocarpum*,) consisting of two mericarps, (i. e. *carpella*, with half of the calyx attached, so that they may be called neither *carpella* nor *achenia*,) separable from a common axis (carpophorus) to which they adhere by their face (commissure); the dorsal surface of each carpel is traversed by ridges, of which five are primary, (*costæ* seu *juga primaria*,) and four secondary (*juga secundaria*); the latter are sometimes absent; the spaces between the ridges are called channels (valleculæ). In the channels, within the pericarp, are sometimes linear oily receptacles, called *vittæ*. *Seed* pendulous, usually adhering inseparably to the pericarp, rarely loose; *embryo* minute, pendulous from the apex of the axis (carpophorus); *radicle* pointing to the hilum; *albumen* abundant, horny, flat (*Orthospermæ*); or rolled inwards at the edges (*Campylospermæ*); or rarely curved inwards from the base to the apex (*Cœlospermæ*).

Herbaceous plants, with fistular furrowed stems. *Leaves* usually divided, sometimes simple, sheathing at the base. *Flowers* in umbels, white, pink, yellow, or blue, generally surrounded by an involucre. (*De Candolle*, *Pereira*.)

This class varies in properties; the individuals composing it yield narcotic, stimulating, or, in some cases, antispasmodic principles.

CONIUM MACULATUM.

# CONIUM MACULATUM.

## LINNÆUS.

## HEMLOCK.

SEX. SYST.—Pentandria, Digynia.

GEN. CHAR.—*Calyx* obsolete. *Petals* obcordate, somewhat emarginate, with a very short inflexed lobe. *Fruit* compressed at the side, ovate. *Half fruits* (mericarps), with five prominent, equal, undulated ridges, of which the lateral are on the border. Channels with many striæ and no vittæ.—Biennials. *Root* fusiform. *Stem* taper branched. *Leaves* decompound. Both involucres 3–5 leaved, the partial one halved. *Flowers* white, all fertile. (*Lindley.*)

SPECIF. CHAR.—*Leaflet* of the partial *involucre* lanceolate. Partial *umbel* short. (*De Candolle.*) *Root* biennial, tap shaped, fusiform, whitish, from six to twelve inches long, somewhat resembling a young parsnip. *Stem* from two to six feet high, round, smooth, glaucous, shining, hollow, spotted with purple. *Leaves* tripinnate, with lanceolate, pinnatifid leaflets, of a dark and shining green colour, smooth, very fetid when bruised, with long furrowed footstalks, sheathing at their base. *Umbels* of many general as well as partial rays. *General involucre* of several (usually three to seven) leaflets; *partial involucre* of three leaflets on one side. *Margin* of the *calyx* obsolete. *Petals* five, white, obcordate, with inflexed points. *Stamina* five, epigynous, as long as the petals. *Ovarium* ovate, two celled, striated. *Styles* two, filiform, spreading. *Stigma* round. *Fruit* ovate, compressed laterally. *Mericarps* (half fruits) with five primary, but no secondary ridges, which are undulato-crenated; the channels have many striæ, but no vittæ. *Seed* with a deep hollow groove in front. (*Pereira's Mat. Med.*)

*Hemlock* is an inhabitant of Europe, and, it is stated by Lindley, the east of Asia. In North and South America it is cultivated. Naturally endowed with great activity, it is greatly modified by the climate and physical circumstances in which it is placed. In Spain, Italy, and Greece, it is highly energetic. In England (Colebrooke) it is diminished in power, and in the Crimea (Stevens) the peasants use it for food. In the United States it is not so efficient, which in a measure may arise from cultivation, as it is not a native.

The term *Cicuta* is sometimes used synonymously with *Hemlock* and *Conium*, but the latter must not be confounded with the true modern *Cicuta*, the *C. maculata* or *C. virosa*. The Latin *Cicuta* and Greek *Conium* (κώνειον) are supposed to have been the same thing, and identical with the plant under consideration. With the Athenians it was the State poison. Among other individuals, Socrates and Phocion perished from its effects. Dr. Pereira argues strongly, that the plant now in use, and that of antiquity, are the same. He bases his opinion upon the following reasons: 1st. Dioscorides describes the Greek plant so accurately, as to lead to the inference of identity. 2d. Hemlock is an inhabitant of Greece, as Dr. Sibthorp has found it in the neighbourhood of Athens. 3d. The name Conium is in use in Greece at the present time; and, 4thly, the effects, as described by the older writers, and those now known, are similar.

Much has been said of Hemlock as a poison. Its reputation as such has been handed down to us. Theophrastus says that the inhabitants of Chio compose of it a subtil poison by bruising it, and from Tournefort we learn that in *Cos*, a law existed obliging every inhabitant to take Hemlock who had arrived at the age of sixty years, as the island was too small for the number of its inhabitants. It was not the only substance in the poisonous draught of the Greeks. Theophrastus states that the juice of the poppy was mixed with it, and the exemption from suffering, exhibited in the death of Socrates, has been attributed to this admixture. (*Pouchet, Traité Elémentaire de Botanique.*)

The plants likely to be confounded with the Conium Maculatum, are *Œthusa cynapium*, *Fools' parsley*, and *Anthriscus sylvestris*, common *Cow parsley*. By attending to the botanical characteristics they can be distinguished.

The officinal portions of C. maculatum are the leaves and seeds; the latter are regarded as most active. The first year's leaves are few and radical, the second year it is of strong growth, and the leaves are full and well formed; they are of a bright green colour, and have the peculiar disagreeable odour of the plant. They are directed to be gathered at the time, or a little later than the time, of flowering, to be dried in a dark airy room, and preserved in close vessels. When dried they should retain their green colour; they have an aromatic odour, and, rubbed with caustic potassa, give out the smell of *conia*.

The seeds (*fructus*) resemble those of anise, for which they can be mistaken; they have a slight odour and a bitter taste; in the dried state they are of a light brown colour, but are more active in the green immature state.



Mo. Bot. Garden
1904.

The composition of the leaves and seeds has been studied by a number of chemists. Brandes and Christison have attained the most accurate results. The contained principles are *conia* and *volatile* oil, resin, &c. *Conia* is an alkaloid principle, and to it the peculiar effects are to be attributed.

The effects are those of an acro-narcotic; it acts as a calmer of nervous excitability, and as a discutient and alterative. In large doses it may occasion death, previous to which delirium and convulsions are the consequences of its exhibition.

The forms of exhibition are the powder of the leaves,—the extract of the juice,—and the tincture. The extract is sometimes inert. Dr. Earle, of the Bloomingdale Asylum, took large doses of such an article without effect. The potassa test should be used to determine the presence of *conia*.

Plate XLI.—*Represents the plant in flower, the flower and fruit.*

# CORNACEÆ.

## DE CANDOLLE.

## THE DOGWOOD TRIBE.

Essential Char.—*Calyx* adherent to the ovary; limb four to five toothed, minute, or four to five lobed, with a valvate æstivation. *Petals* distinct, equal in number to the teeth of the calyx, and inserted alternately with them into the margin of the hypogynous disk, broad at the base, æstivation valvate. *Stamens* four to five, inserted with the petals, and alternate with them; *anthers* introrse, mostly cordate. *Ovary* one-celled, with a solitary pendulous ovule in each cell. *Styles* single. *Drupes* baccate, with a one or two-celled nucleus, crowned with the remains of the calyx. *Seeds* anatropous. *Embryo* nearly the length of the fleshy albumen; the radicle shorter than the oblong cotyledons.

*Trees* or *shrubs*, rarely herbaceous, with a bitter bark. *Leaves* opposite, (or rarely somewhat alternate,) mostly entire, exstipulate, pinnately veined. *Flowers* cymose; the inflorescence sometimes capitate, and involucrate, rarely dioecious. *Hairs* centrally affixed. (*Torrey and Gray, in Flora of North America.*)

The *Cornaceæ* are characterized by the existence of a bitter principle, which renders them useful as anti-febrile remedies. A number of species of Cornus are in use.

# CORNUS FLORIDA.

## LINNÆUS.

## DOGWOOD.

Sex. Syst.—Pentandria Monogynia.

Gen. Char.—Limb of the *calyx* four toothed, minute. *Petals* oblong, spreading. *Filaments* filiform. *Style* sub-clavate. *Stigma* obtuse or capitate. *Drupes* connate into a syncarpium. *Leaves* entire, minutely scabrous, with the adpressed bicuspidate hairs. *Flowers* white, rarely yellow. (*Torrey and Gray, in Flora of North America.*)

Specif. Char.—*Leaves* of the involucre four, obcordate, or with a callous notch at the apex. *Drupes* oval. *Leaves* ovate acuminate.

Dogwood is a small tree varying in height from fifteen to twenty or thirty feet, rarely attaining more, with an irregular growth. The branches are numerous and expanded. It is a conspicuous ornament of the forest in the spring of the year, when the large leafy involucres are expanded, and resemble showy white flowers diffused in every direction. Within the involucres are the flowers, in clusters, rather inconspicuous, of a greenish yellow colour. The leaves are developed after the flowers. In the fall of the year they become deep red. The drupe or berry is bright red when mature.

This plant is common throughout the United States, growing in open woods, in moist soil, from Canada to Florida, and Louisiana. Its growth is modified by the climate; to the South it attains its extreme size. In the Northern sections of the country the time of flowering is May, but in the Southern it is during March and April.

CORNUS FLORIDA.

The bark of the tree constitutes the officinal portion; that from the root is regarded as most efficacious. It is brought into the market in pieces slightly quilled, several inches long, half an inch to two inches broad, and two or three lines thick, of a grayish red colour, breaking with a short fracture, and exposing lighter coloured surfaces, mottled with red and white. The pieces from the root are rougher externally, and more frequently destitute of epidermis. The odour is feeble; the taste bitter and astringent, with a little aroma. In the fresh state, the taste is acrid.

Dr. Walker wrote an essay on this bark in 1803. He found it to contain gum, resin, with tannic and gallic acids. To these Mr. Cockburn (*Am. Journ. of Pharm.*) has added oil, fatty matter, a crystalline substance, bitter extractive, wax, red colouring matter, &c. From his experiments it appeared that the bitterness alone resided in the extractive matter, from which the crystalline substance is obtained. A principle called *cornine* was announced some years ago by Mr. G. W. Carpenter.

The Dogwood bark is a tonic. By Dr. Walker it was found to augment the force of the pulse, and increase the heat of the body. It is also an astringent. It has been used in intermittent fever in lieu of Cinchona, but the large doses required, frequently disordered the stomach. It is used in powder, infusion and decoction.

PLATE XLII.—*Represents the plant in flower, a fully expanded leaf, and the dissected flower and the fruit.*

# CINCHONACEÆ.

## LINDLEY.

ESSENTIAL CHAR.—Trees, shrubs or herbs. *Leaves* simple, quite entire, opposite or verticillate, with interpetiolary stipules. *Flowers* arranged variously, usually in panicles or corymbs. *Calyx* adherent, with a definite number of divisions or none. *Corolla* superior, tubular, regular, with a definite number of divisions which are valvate or imbricate in æstivation, and equal to the segments of the calyx. *Stamens* arising from the corolla, all on the same line and alternate with its segments. *Ovary* inferior, surmounted by a disk, usually two-celled, occasionally with several cells; *ovules* numerous and attached to a central placenta, or few and erect or ascending, anatropal or amphitropal. *Style* single, inserted, sometimes partly divided. *Stigma* usually simple, sometimes divided into a definite number of parts. *Fruit* inferior, either splitting into two cocci, or indehiscent and dry, or succulent, occasionally many-celled. *Seeds* definite or indefinite; in the former case erect or ascending, in the latter attached to a central axis: *embryo* small, oblong, orthotropal or homotropal, surrounded by a horny albumen; *cotyledons* thin; *radicle* longer, inferior. (*Lindley.*)

This order constituted a portion of *Rubiaceæ* of Jussieu, which by Lindley has been separated into *Cinchonaceæ* and *Stellatæ*. The Cinchonaceous tribe is one of the most remarkable and interesting, in consequence of the number of active plants constituting it, and their peculiar richness in alkaloid principles, of which cinchonia, quinia, and emetia are examples; some neutral principles also exist, as *caffein* and *catechuine*. There is some difference in the medical properties of the individuals composing it; thus the cinchonas are tonic and anti-febrile, the ipecacuanhas are emetic, and gambir is astringent, while coffee is stimulating.

A large number of the most active of the tribe are natives of South America; but they are not confined to that region. Some valuable ones are to be found in North America, a few in India, and many in the West Indies and the Pacific Islands.

# CINCHONA CORDIFOLIA.

## MUTIS.

SEX. SYST.—Pentandria, Monogynia.

GEN. CHAR.—*Calyx* five toothed. *Corolla* hypocrateriform, with a five parted limb, valvate in æstivation. *Anthers* linear, inserted within the tube, and not projecting, unless in a very slight degree. *Capsule* splitting through the dissepiment into two cocci, open at the commissure, and crowned by the edge. *Seeds* girted by a membranous lacerated wing.

SPECIF. CHAR.—*Branches* quadrangular, smooth. *Leaves* roundish, obtuse at both ends, especially at the base, or roundish-oblong and tapering at the base, strongly veined, thin, quite smooth above, soft with down on the under side,

and hairy at the veins and axils when young, becoming nearly smooth when old, never pitted. Panicle contracted, thyrsoid, leafy at the base, or formed of corymbose peduncles, axillary to the upper leaves; with the ramifications tomentose. *Calyx* tomentose, with a large, smooth, campanulate, five toothed cup, the lobes of which soon become quadrate and cuspidate; the tube, when it first begins to swell, after the flowers have dropped, subglobose, but soon after lengthening. *Corolla* tomentose, with a thick tube, the diameter of which is equal to the length of the shaggy lobes (*Lindley.*) The cordiform character of the leaf is not mentioned by Lindley, it is only found in some states of the leaf.

The C. cordifolia is a spreading tree, fifteen to twenty feet high, rising on a single, erect, round stem.

It inhabits the mountains of New Granada, under the fourth degree of North Latitude, at an elevation of from 5000 to 8000 feet above the sea, according to Humboldt. It is the plant described by Mutis, as found in the neighbourhood of St. Fée de Bogota, and is supposed by him to yield the *Yellow Bark;* it is thus assumed by the London and Dublin Colleges, but it has been discovered that the *Yellow Carthagena Bark* of Guibourt, (*China flava dura, Bergen,*) and the product of this tree are identical. It does not yield the *Royal Yellow* or Calisaya Bark, which is the only officinal Yellow Bark in the U. S. P., but a non-officinal article. The exact source of the Officinal Yellow which comes from Bolivia, or what was formerly Southern Peru, is not exactly known. (See *Pereira, Mat. Med.*, art. *Cinchona Calisaya.*)

Hayne, in his article upon this species, has specified varieties, which are *tomentosa, villosa, pubescens* and *glabra;* the latter corresponding to the *C. officinalis* of Linnæus, which refers either to this plant or the *C. condaminea.* From the differences, as regards covering to the leaves, thus specified, and the peculiar proneness to change in their form, may have arisen the mistake of supposing that it is the same as *C. ovata,* Ruiz and Pavon; and *C. pubescens,* Vahl, which is corrected by Lindley. By the common people in the province of New Granada, it is called Velvet Bark.

The bark of C. cordifolia is imported in serons, weighing eighty to one hundred pounds, from Carthagena. "It occurs in fine, middling, and thick quills, and in flat pieces. The quills vary in diameter from three to eight lines, in thickness from a half, to one and a half lines, in length from five to nine, rarely to fifteen inches. The flat pieces are more or less twisted, arched, or warped (sometimes like pieces of dried horn) in drying, and are from a half to two inches broad, two to seven lines thick, and four to eight, rarely twelve inches long. The coat, which is usually more or less rubbed off, is thin, soft, somewhat corky, laminated, with irregular longitudinal furrows; transverse cracks and warts are rare. The epidermis is whitish (micaceous) yellowish white, or ash gray. The inner surface is smooth or splintery, frequently hollowed out. The prevailing tint of the cortical layers is usually dull ochre yellow. The longitudinal fracture (which is with difficulty affected), is uneven, short, and coarse splintery; the transverse fracture is short, splintery. The taste is moderately bitter and slightly astringent. The powder is cinnamon coloured." (*Pereira.*) In our market, as remarked in the U. S. Dispensatory, the pieces are comminuted, and much smaller; in fact, it is rather in fragments than entire pieces.

The amount of cinchonia and quinia in the *Hard Carthagena yellow bark*, as found by *Von Santen*, was, Cinchonia, 30 grs., and Quinia as sulphate, 32 grs. to the pound of quills and flat pieces; from the flat pieces alone, he obtained C. 36 grs. Sulph. Q. 5 grs. Gœbel and Kirst found in it 56 grs. Quinia, and 43 grs. pure Cinchonia. It belongs to the third division of Geiger, or of barks containing nearly equal quantities of the alkaloids.

This bark is moderately efficacious as an anti-febrile, but is powerfully tonic.

PLATE XLIII.—*Represents the plant in flower, a fully expanded leaf, and the dissected flower, with the capsule.*

# CINCHONA MICRANTHA.

## RUIZ AND PAVON.

C. SCROBICULATA.—*Humboldt* and *Bonpland.*

SEX. SYST.—Pentandria, Monogynia.

GEN. CHAR.—See previous species.

SPECIF. CHAR.—*Branches* quadrangular, quite smooth, except among the inflorescence. *Leaves* oblong, obtuse, or hardly acute, rather membranous, very large, often a span long without the petiole, quite smooth on each side, very distinctly pitted at the axils of the veins, and either smooth or hairy there; the uppermost, at the base of the inflores-

TECTIDNA MICRANTHA.

CINCHONA CONDAMINEA.

cence, shorter and blunter. *Panicle* loose, terminal, leafless, with the upper divisions downy. *Flowers* the smallest in the genus, except C. lancifolia. *Calyx* tomentose all over, with a short five-toothed limb, scarcely at all altering in the fruit. *Corolla* tomentose, woolly inside the limb. (*Lindley.*)

Ruiz and Pavon state that this tree is from thirty to sixty feet high, terminating in a leafy head, standing solitary and erect, with an irregular and round trunk. The bark is rough and of a cinereous-brown colour. The flowers appear white, although they are tinged of a red colour, the calyx being purplish. It flowers in May, June and July.

Its habitation is in high, cool and wooded mountainous districts of the Andes near San Antonio de Playa grande, whence Tafalla in 1797, procured it and gave specimens to Ruiz and Pavon It grows in Peru near Chicoplaya and Monzon, and in the vicinity of St. Jaen Bracamorros, where it was found by Humboldt and Bonpland.

Dr. Lindley regards this plant as unquestionably the same as C. scrobiculata. H. and B. and R. and P. unite in stating that from the tree is obtained the *Cascarilla fina.* The former say it is the most common and most esteemed kind of all collected in St. Jaen.

Upon Poppig's authority, who is the latest trustworthy writer, it appears that the C. micrantha is the source of the bark which, in the vicinity of Cuchero, is called *Cascarilla provinciana.* M. Reichel compared his specimens of it with those of Bergen and found that they were the same as the *Huanuco bark* of commerce. Hence, as admitted by Lindley and Pereira, it affords the *Silver or Gray bark* of English commerce.

The *Ash Cinchona* of Bergen, *Cinchona Jaen*, is an inferior pale bark, supposed to be derived from *C. ovata*, but Lindley states that there is no evidence that this species grows about Jaen. It is probable that the bark in question is an inferior kind of that from C. micrantha, (of which Poppig states there are three kinds, the finer peeled from the branches, and answering to *Cascarilla fina,*) or it may be from some other species in the neighbourhood, which affords inferior barks, as stated by H. and B.

Huanuco bark always occurs in the form of quills; they are larger and coarser than those of Crown bark, approaching to yellow, but smoother on their external surface. The quills are three to fifteen inches in length; in diameter two lines to one or two inches; in thickness from one-third to five lines. The edge of the quill is oblique, not found on other bark. The epidermis is transversely cracked, not in the form of rings as in Loxa bark, and the edges of the cracks are flat. On the thicker quills are to be observed longitudinal furrows, and the cracks are frequently wanting. The colour of the epidermis is whitish, in the smaller quill whitish-gray; in the larger, cretaceous. This depends upon crustaceous lichens, and from it arise the terms *silver* and *gray.* The structure of the inner surface is smooth in the small quill, fibrous in the larger ones; the colour is reddish or rusty brown. The fracture is even and resinous, the odour clayish or sweet, which, according to Bergen, is peculiar to it. Taste astringent, aromatic, and bitter; powder deep cinnamon brown. (*Pereira.*)

This species of bark is rich in *Cinchonia*, existing in the form of *Kinate.* Various quantities have been obtained by different chemists; the average proportion is from a drachm to two. It belongs to the first class of Geiger.

As a tonic, Huanuco bark is potent; as an anti-febrile it is inferior to the yellow or red officinal barks. It is used for fabricating the extract of bark, and for preparing cinchonia, which is less used than it deserves.

PLATE XLIV.—*Represents the plant in flower, the dissected flower, fruit and seed.*

# CINCHONA CONDAMINEA.

## HUMBOLDT AND BONPLAND.

SEX. SYST.—Pentandria Monogynia.

GEN. CHAR.—See C. cordifolia.

SPECIF. CHAR.—A tree eighteen feet high, with a straight cylindrical trunk a foot in diameter. The *bark* is of an ash gray, cracked and filled with a yellowish juice, which exudes by incision, having an astringent and bitter taste. The *branches* are opposite, straight, the inferior horizontal, rising at the extremities, the superior sloping upwards (giving a pyramidal form to the tree). The bark of the young branches is smooth, green, gray, easily separating and more astringent. The *leaves* are opposite, oval lanceolate, glabrous, three or four inches long, (lanceolate in some specimens, ovate in others,) almost coriaceous, petiolated, beneath nerved, the principal nerve most prominent and often of a beautiful red colour. In the axils of the nerves is a small pit (scrobicula), the margin of which is beset with hairs; it contains a clear astringent fluid. The superior face is more shining, of a deep green, presenting small tuber-

cles which correspond to the depressions on the inferior face, disappearing in the old leaves, leaving only vestiges of them. The petiole is six times shorter than the leaves, flat on one side, convex on the other, most frequently rose coloured, as well as the principal nerve. *Stipules* two, opposite, caducous, six to eight lines in length, covered on the under side with a mucilaginous acid liquid, externally provided with numerous hairs. *Flowers* white, often of a beautiful rose colour, disposed in a panicle at the extremity of the branches,—having an agreeable odour. *Peduncles* cylindrical, silky, divided into threes, pedicels one-flowered, bracteolate; bracts small, acute, persistent. *Calyx* persistent, four lines long, campanulate, silky and pulverulose, five toothed. *Corolla* funnel shaped, an inch long, caducous, tube marked with five obtuse angles, which often split their entire length, covered with short silky hairs, limb shorter than the tube, divided into five equal parts, divisions oval (roundish triangular), covered above with numerous long white hairs. *Stamens* five, shorter than the tube of the corolla. *Ovary* oval glabrous. *Style* straight. *Stigma* divided into two parts. *Fruit* capsule oval, bilocular, crowned by the teeth of the calyx, marked by two opposite sutures, separating into two valves. *Seeds* lenticular, provided with a membranous border. (*Condensed from Humboldt and Bonpland, Plantes Equinoc.*)

This plant is named by Humboldt and Bonpland, in honour of the French mathematician and naturalist *De La Condamine*, who first noticed it From this species the genus Cinchona was formed in 1742 by Linnæus, and published in the second edition of the *Gen. Plant.* The specimens were sent to him by De La Condamine, and he gave the name to this the only species he then possessed of *Cinchona officinalis*, but subsequently confounded under the same name, from supposing it to be a variety, the *C. cordifolia* procured from Mutis. De La Condamine wrote a paper on the plant in the *Acta Paris*, for 1738. Subsequently to Linnæus' publication, a number of species were placed to the C. officinalis, which have since been declared to be distinct. Ruiz and Pavon do not describe the C. condaminea, but only refer to it as affording a superior kind of bark. (*Unpublished Memoir, seen by Lindley.*) The nearest approach to the present species is the *C. lancifolia* Mutis, which Bonpland, in a MS. note in Lambert's Herbarium, supposes identical, an error corrected by Humboldt and alluded to by Lindley. In the Herbarium of the Academy of Natural Sciences, are specimens of both, the *C. condaminea* labelled "Serro de Uritusinga, near Loxa, from Wm. Jameson, Esq.;" and the *C. lancifolia*, labelled "Bonpland, from Baldwin, New Granada." The difference between them is so essential and apparent, that to mistake the one for the other would seem impossible.

The C. condaminea grows near Loxa, in the mountains of Cajanuma Uritusinga, and in those of Boqueron, Villonaco and Monje. It is also found near Guancabamba and Ayavaca in Peru. It always grows on micaceous schist, and rises as high as 9500 feet above the level of the sea, first appearing at the elevation of 5700 feet; so that it occupies a zone of 1800 feet. (*Humboldt.*) From this plant is obtained, according to the best authorities, the *Crown bark*, or Loxa bark of English commerce. The best bark is obtained from it, but inferior qualities are mixed, hence the difficulty of identifying all the samples in the cases by the description of the bark. The reason why this bark was called *Crown bark*, is, that it was used by the royal family of Spain. It is a matter of history that in 1804, a Spanish vessel was captured off Cadiz by the English, in which were found parcels of this bark, labelled "*Para la real famalie.*"

It is a quilled bark, in length six to fifteen inches, in diameter two lines to an inch, in thickness one-third to two lines, singly and doubly rolled. Externally it is cracked transversely, the cracks at short distances from each other, and elevated at the edges. It is also furrowed. The thick quills are rough and warty. The epidermis is grayish brown, varied by the crustaceous lichens; the larger quills are darker coloured. The inner side is smooth—and of a cinnamon brown colour. It has a tan-like odour, and a bitter astringent, somewhat aromatic taste.

From the analysis of chemists, as Pelletier and Caventou and Bucholz, this bark contains *cinchonia* only. It is used as a tonic and febrifuge, but has given way to the barks which contain quinia.

Plate XLV.—*Represents this plant in flower, with the dissected flower, and the fruit.*

# CEPHÆLIS IPECACUANHA.

## RICHARD.

## IPECACUANHA.

Sex. Syst.—Pentandria Monogynia.

Gen. Char.—Tube of the *calyx* obovate, limb very short, five toothed. *Corolla* somewhat funnel shaped; its

CEPHAELIS IPECACUANHA

lobes five, small, rather obtuse. *Anthers* enclosed. *Stigma* bifid, usually exserted. *Berry* obovate oblong, crowned with the remains of the calyx, two-celled, two-seeded. (*De Candolle.*)

SPECIF. CHAR.—*Root* perennial, simple, or divided into a few diverging branches, seldom more than from four to six inches long, about as thick as a goosequill, ringed, when fresh pale brown, when dry umber coloured, blackish umber coloured, or grayish brown, the cortical integument with a reddish resinous glittering fracture, and readily separating from a central woody axis. *Stem* suffruticose, from two to three feet long, ascending, often rooting near the ground, smooth and cinerous at the base, downy and green at the apex. *Leaves* seldom more than 4—6 on a stem, opposite, oblong, obovate, acute, 3—4 inches long, 1—2 broad, roughish with hairs; petioles short, downy; stipules erect, adpressed, membranous, 4—6 cleft. *Peduncles* solitary, axillary, downy, erect when in flower, reflexed when in fruit, about one and a half inches long. *Flowers* capitate; *involucre* one leafed, spreading, deeply four to six parted, with obovate acuminate, ciliated segments. *Bractes* to each flower one, obovate oblong, acute downy. *Calyx* minute, obovate, with five bluntish short teeth. *Corolla* white, funnel shaped; tube cylindrical, downy on the outside and at the orifice; limb shorter than the tube, with five ovate reflexed segments. *Stamens* five. *Filaments* filiform, white, smooth. *Anthers* linear, longer than the filaments, projecting a little beyond the corolla. *Ovary* with a fleshy disk at the apex. *Style* filiform. *Stigmas* two, linear. *Berry* ovate, about the size of a kidney bean, dark violet, crowned by the small calyx, two-celled, two-seeded, with a longitudinal fleshy dissepiment. *Nucules* (seeds) plano-convex, furrowed on the flat side. (*Lindley.*)

This plant produces the officinal *ipecacuanha.* It is a native of Brazil, growing in moist situations, from 8° to 20° south latitude. It is abundant in the valleys of the granitic mountains, which run more or less distant from the sea, through the provinces of Rio Janeiro, Espirito Santo and Bahia. It is also met with in Pernambuco. Humboldt and Bonpland state that they found it on the St. Lucar mountains of New Granada, but it must have been the Psychotria emetica. See conclusion of the account below.

The root is called *annulated ipecacuanha,* to distinguish it from the *undulated* and *striated.* The origin of this drug was for a long time involved in obscurity. Pereira says that Michael Tristram first mentioned it under the name of *Igpecaya* or *Pigaya.* It was introduced into Europe about the middle of the seventeenth century, under the name of the Brazilian root. The first account of the plant was given by *Piso* and *Marcgrave* in their work entitled *Historia Naturalis Braziliæ;* Amsterdam, 1648; the account being written by Piso. He describes two kinds of Ipecacuanha, one the white, (undulated, from Richardsonia scabra,) the other brown, (the officinal;) of the latter he gave a rude figure. Although this account was published, and the details so accurately given, that they have merely been extended subsequently, the source of the drug became a matter of speculation, and even Linnæus was led into error. His son, in the *Supplement,* having obtained the *Psychotria emetica* from Mutis, (Peruvian ipecacuanha.) supposed it was the true one; this occurred in 1781. In 1800, Dr. Gomes returned from Brazil, and the following year he published a memoir on Ipecacuanha, in which he distinguished the true one from the two others; but having communicated his information and given specimens to his countryman Brotero, in 1802, that individual published surreptitiously a paper upon the subject in the Transactions of the Linnæan Society of London, giving to the plant the name of *Callicocca ipecacuanha.* In 1813, M. Tusac changed the name to *Cephælis ipecacuanha,* having obtained the memoir of Brotero from M. Hectot, of Nantes, to whom Brotero had given it, and finally in 1818, M. Richard again insisted on the propriety of this name, which has since been adopted. Upon the subject a controversy sprung up between the latter authority and Merat, with respect to priority of publication upon the distinction between the Cephælis and Psychotria, which had again been thrown into doubt by Humboldt, who had met with the Peruvian plant, but had no knowledge of the other. The reason for the change from Calicocca to Cephælis was the agreement with the characters of the latter genus as established by *Swartz.*

From Martius, Pereira has compiled the following information. "The roots are gathered at all seasons of the year, though more frequently from January to March inclusive, and as no care is taken in the cultivation of the plant, it has become scarce around the principal towns. Those Brazilian farmers who reside in the neighbourhood of the plant, carry on considerable commerce in it. The native Indians also are very assiduous in the collection of it. Those called by the Portuguese the Coroados, who live near the river Xipoto, in the province of Minas, as well as their neighbours the Puri, are the greatest collectors of it. They sometimes leave their villages for two months at a time, fixing their habitations in those places in which this plant abounds. They cut the roots from the stems, dry them in the sun, and pack them in bundles of various sizes and forms."

Three varieties of the officinal ipecacuanha are signalized by Guibourt, the *brown,* the *red,* and the *gray:* the first is most common. The difference between them must depend upon soil and location. Ipecacuanha is found in pieces

three or four inches long, about the thickness of a quill, contorted and twisted. It is called *annulated*, because each piece is knotty and presents the appearance of rings; these annulations are irregular, not only as regards the contiguous ones, but in each distinct one, the sides being unequal. It is composed of a cortical portion, breaking with a waxy fracture, and an internal ligneous cord (*meditullium*). It has an aromatic, acrid, somewhat bitter taste, and a nauseous peculiar smell.

Among other principles, it contains an odorous fatty matter and *emetia*, which is the active principle; this is capable of union with acids.

Ipecacuanha is an emetic, mild and safe in its operation; in small doses it is alterative and sudorific.

The history of the introduction of this root into practice is as curious as its botanical history. Although known in 1648, it did not attract attention in Europe until 1672, when it was carried to Paris by Legras, a medical traveller, who disposed of it to an apothecary; being administered in too great a dose, some prejudice was created against it. In 1680, a merchant named Garnier obtained 150 pounds weight of it, from whose hands it came into those of Helvetius. This Dutch physician, experimenting with it, proclaimed that he had an invaluable remedy in dysentery, was permitted to use it in the hospitals, and finally curing the Dauphin, sold his secret to Louis XIV. for a thousand louis d'or, and public honours, when it became public. The rewards were disputed by his colleague Garnier. Since that time the popularity of the medicine has been established. The *pulvis helvetii* was constituted of ipecacuanha as the basis.

There are a great number of modes of employing ipecacuanha, well calculated to bring out its peculiar effects; the powder, pill, syrup, wine, are most employed. It is given constantly in combination with other substances.

Plate XLVI.—*Represents the plant in flower, and fruit, with a dissection of the flower magnified.*

# VALERIANACEÆ.

## LINDLEY.

## THE VALERIAN TRIBE.

Valerianeæ.—*De Candolle.*

Essential Char.—Tube of the *calyx* adnate to the ovary; limb various, either dentate or partite, or changed into a pappus, which is first involute, afterwards expanded. *Corolla* tubular, funnel shaped; usually five lobed, rarely three or four lobed; lobes obtuse; tube equal or gibbous, or calcarate at base. *Stamens* adnate by their filaments to the tube of the corolla; free at the apex; alternate with the lobes of the corolla, five (the type), four, three, two, or solitary. *Anthers* ovate, bilocular. *Style* filiform. *Stigmas* two or three, free or cohering. *Fruit* membranous, or somewhat mucamentaceous, indihiscent, crowned, at least when young, with the limb of the calyx; either three-celled (two cells being empty), or one-celled. *Seeds*, in the fertile cell or fruit, solitary, pendulous, exalbuminous; embryo erect, with a superior radicle and two flat cotyledons. (*De Candolle and Pereira.*)

The valerian tribe is composed of annual or perennial plants, herbaceous and rarely shrubby, occasionally twining. The leaves are collected in rosettes at the root, or distributed on the stem, opposite, entire, or variously divided in a pinnate form, without stipules. The flowers are sometimes male or female by abortion. The medical properties are stimulating, tonic and antispasmodic, in many of them to an inordinate extent; they are highly odorous. The properties are due to volatile oil and resin, with respect to the generation of which Fee (*Cours d'Histoire Naturelle*) states, "we have already remarked, that the duration of plants was necessary to permit the development of the gum resins, and essential oils. The family which now occupies us, presents a remarkable example of this truth. The annual Valerianeæ are inodorous in all their parts, while the perennial have slightly odorous flowers, and roots which contain an essential oil of very strong odour, upon which their medical virtues depend." They are natives of most temperate climates, sometimes at considerable elevations. They are abundant in the north of India, Europe and South America, but uncommon in Africa and North America. (*Lindley, Veg. King.*)

Plate XLVII.

VALERIANA OFFICINALIS.

# VALERIANA OFFICINALIS.

## LINNÆUS.

## GREAT WILD VALERIAN.

SEX. SYST.—Triandria Monogynia.

GEN. CHAR.—Limb of the *calyx* rolled up during flowering, then unrolled into a deciduous feathery pappus, consisting of many plumose setæ. *Corolla* obconical, or cylindrical,—equal at base or gibbous, but without a spur; limb bluntly five cleft, rarely three-fid. *Stamens* three. *Fruit* indehiscent; when ripe, one-celled, one-seeded. (*Lindley.*)

SPECIF. CHAR.—*Root* tuberous (very fibrous), somewhat creeping, fetid. *Stem* about four feet high, furrowed. *Leaves* pinnate; *leaflets* coarsely serrated; those of the radical leaves broadest, approaching to ovate. *Panicles* cymose, contracted. *Bracteolæ* ovate, lanceolate, acuminate, herbaceous, membranous at the edge, compressed, rather longer than the ovary. *Calyx* superior, rolled inwards in the form of a rounded thickened rim. *Corolla* white, funnel shaped, smooth; the tube gibbous at the base on that side of the flower turned away from the axis; hairy internally; limb spreading, divided into five, nearly equal, concave, linear, rounded lobes. *Stamens* three, exserted, white, from the middle of the tube of the corolla. *Ovary* inferior, narrow, oblong, compressed, one-celled, with a single pendulous ovule. *Style* filiform. *Stigma* divided into three filiform lobes. *Fruit* light brown, linear ovate, compressed, with a slightly elevated ridge on one side, terminated by the permanent calyx, whose limb has unrolled into twelve filiform plumose recurved segments, crowning it like a pappus. (*Lindley.*)

This is a European plant essentially, although it is cultivated in this country, and from its tall and erect stature, deep green and shining leaves and pinkish-white flowers, constitutes an ornament to the gardens. It varies its character so as to present decided varieties, principally marked in the size of the plant and the expansion or contraction of the leaves. It flowers in June.

The root is the officinal portion. It consists of a short, tuberculated rhizome, beset with a great number of fibres, which are from two to six inches long, delicate, white internally, but brownish externally, becoming darker by drying, and then rolling themselves into the form of balls. The odour is strong and peculiar, the taste warm, bitterish and unpleasant.

The sensible properties of odour and taste vary according to the position in which the plant has grown. If in a wet soil, the vital efforts seem to be expended on the herbaceous portions, leaving the root less charged with the peculiar principles, while, on the contrary, if the soil has been dry, the reverse is the case.

This root contains *volatile oil* and an acid to which the name of *valerianic* has been given. The oil (*valerole*) exists in the fresh state; by oxygenation it is converted into the acid, as observed by Gerhardt. The two co-exist in old roots. The acid forms salts with bases, some of which are employed as medicinal agents. It also contains *resin* and *extractive*.

Valerian is a stimulant and antispasmodic, employed in nervous affections, and in combination with tonics in cases of neuralgia, or diseases with nervous complications. It is used in powder, infusion, tincture and extract. The oil is sometimes employed.

PLATE XLVII.—*Represents the plant in flower, the magnified flower and the metamorphosed calyx, with the fruit.*

# COMPOSITÆ.

## ADANSON.

SYNANTHERÆ.—*Royle.* ASTERIACEÆ.—*Lindley.*

ESSENTIAL CHAR.—Herbaceous plants or shrubs. *Leaves* alternate or opposite, without stipules, usually simple but commonly much divided. *Flowers* (called florets) unisexual or hermaphrodite, collected in dense heads upon a common receptacle, surrounded by an involucre. *Bracts* either present or absent; when present, stationed at the base of the florets, and called *paleæ* of the receptacle. *Calyx* superior, closely adhering to the ovary, and undistinguishable

from it; its limb either wanting or membranous, divided into bristles, paleæ, hairs, or feathers, and called pappus. *Corolla* monopetalous, superior, usually deciduous, either ligulate or funnel-shaped; in the latter case four or five-toothed, with a valvate æstivation. *Stamens* equal in number to the teeth of the corolla, and alternate with them; the *anthers* cohering into a cylinder. *Ovary* inferior, one-celled, with a single erect ovule. *Style* simple. *Stigmas* three, either distinct or united. *Fruit* a small, indehiscent, dry pericarp, crowned with the limb of the calyx. *Seed* solitary, erect; *embryo* with a taper inferior radicle; albumen none. (*Lindley, Veg. King.*)

The above author further states that this is one of the most natural and extensive families of the vegetable kingdom, at all times recognized by its inferior one-celled ovary, with an erect ovule, syngenesious stamens and capitate flowers.

The compositæ constitute a very large proportion of the vegetation of every country, varying much as regards their duration, and ranging from merely herbaceous plants to trees. M. Lasegue estimates the number as one-tenth of all described plants. (*Op. cit.*) Such as are medicinal owe their properties to a bitter matter, astringent principle, acrid resin, and volatile oil; some few have peculiar principles, some have colouring matter used as dyes. De Candolle has made three Sub Orders of this class, viz., *Tubuliflorœ*, *Labiatiflorœ*, and *Liguliflorœ*.

# ANTHEMIS NOBILIS.

## LINNÆUS.

## CHAMOMILE.

Sex. Syst.—Syngenesia, Polygamia superflua.

Gen. Char.—Head many flowered, heterogamous. *Florets* of the ray in one row, ligulate, female, (rarely none or somewhat tubular,) of the disk hermaphrodite, tubular, five-toothed. *Receptacle* convex, oblong, or conical; covered with membranous paleæ between the flowers. *Involucre* imbricated, in few rows. Arms of the *style* without appendages at the apex. *Achene* tapering or obtusely four-cornered, striated or smooth. *Pappus* either wanting, or a very short, entire, or halved membrane; sometimes auriculate at the inside. (*De Candolle.*)

Specif. Char.—*Roots* strong, with long fibres. *Stems* in a wild state prostrate, in gardens more upright, a span long, branched leafy, hollow, round, furrowed downy. *Leaves* doubly pinnate, with narrow linear segments, not truly thread-shaped or cylindrical, but rather flat or channelled above, convex beneath; all acute, often bristle-pointed, a little hairy. *Flower heads* terminal, solitary, rather longer than a daisy, with a convex yellow disk, and numerous white, spreading, or reflexed rays. The *scales* of the receptacle do not appear until the florets of the disk are turned to one side, and the innermost are gradually narrowest; all thin and membranous, not sharp. *Involucre* with shining membranous-bordered scales, rather downy. *Receptacle* obtusely conical. *Achœnia* very obscurely bordered at the summit. (*Smith. Lindley.*)

This is a common plant in Europe where it grows wild and is cultivated. It has been introduced into the gardens of the United States. It is a perennial plant, flowering from June to September.

The flowers constitute the officinal portion, under the name of *Chamomile*, and in Europe they are designated as *Roman Chamomile.* The drug is found in two states, that natural to the plant, in which the ray and disk are preserved,—called *single*, and that in which the florets are all converted into such as compose the ray,—*double* chamomile. The single flowers contain most volatile oil which resides abundantly in the disk; this, in a measure, is lost in the double—the latter are preferred, however, from the existence of the bitter principle with enough of aroma to render them agreeable. The distinction is at once perceptible.

Chamomile flowers, when dried, have white globose heads, are possessed of a strong fragrant odour, and a bitter aromatic taste. They change colour from exposure to the atmosphere.

They contain *volatile oil, bitter extractive* and *tannin.*

As a medicine Chamomile is used for its tonic and somewhat stimulating properties; in large quantities as an emetic. The modes of administration vary; that of infusion, cold or hot, is the one usually employed.

Plate XLVIII.—*Represents the plant in flower, and the enlarged flower and fruit.*

ANTHEMIS NOBILIS.

INULA HELENIUM.

ARNICA MONTANA.

# INULA HELENIUM.

## LINNÆUS.

## ELECAMPANE.

Sex. Syst.—Syngenesia. Polygamia superflua.

Gen. Char.—*Head* many flowered, heterogamous. *Florets* of the ray female, in one row, sometimes by abortion sterile, usually ligulate, rarely somewhat tubular and trifid; those of the disk hermaphrodite, tubular, five-toothed. *Involucre* imbricated in several rows. *Receptacle* flat, or somewhat convex, naked. *Anthers* with two setæ at the base. *Achene* without a beak, tapering, or in *I. helenium* four-cornered. *Pappus* uniform, in one row, composed of capillary roughish setæ. (*De Candolle.*)

Specif. Char.—*Root* thick, branching, aromatic, bitter and mucilaginous. *Stem* three feet high, leafy, round, furrowed, solid, branched, and most downy in the upper part. *Leaves* large, ovate, serrated, veiny, downy and hoary at the back; radical ones stalked, the rest sessile, clasping the stem. *Flower* heads solitary at the downy summits of the branches, two inches broad, bright yellow. Scales of the involucre broad, recurved, leafy, finely downy on both sides. *Rays* very numerous, long and narrow, each terminating in three unequal teeth. *Achænia* quadrangular, smooth. *Pappus* roughish. *Receptacle* reticulated, not quite smooth, or naked. (*Lindley.*)

This plant is a native of Europe, but has been introduced into this country. It flowers in July and August.

The root is the officinal portion. It is thick, somewhat spindle shaped, and disposed to branch. It is of a light brown colour externally. As it is found in the shops, it is in longitudinal pieces, (quarters,) of a grayish colour, wrinkled and corrugated, somewhat tuberculated on the external coating, having an aromatic camphoraceous odour, and a warm, bitter taste.

The constituents, according to Prof. John, are volatile oil, elecampane camphor, acrid resin, bitter extractive, *inulin*, and the ordinary constituents of vegetables. The last mentioned has some of the attributes of starch, but iodine colours it yellow.

Elecampane is an aromatic tonic, a stimulant, diaphoretic and expectorant. It is given in powder and decoction.

Plate XLIX.—*Represents the root, the plant in flower, and the organs of reproduction.*

# ARNICA MONTANA.

## LINNÆUS.

## MOUNTAIN ARNICA.

Sex. Syst.—Syngenesia. Polygamia superflua.

Gen. Char.—*Head* many flowered, heterogamous. *Florets* of the ray in one row, female, ligulate; of the disk hermaphrodite, tubular five-toothed. *Involucre* campanulate, in two rows, with linear lanceolate equal scales. *Receptacle* fringed hairy. Tube of the *corolla* shaggy; sometimes some rudiments of sterile stamens remaining in the ligulæ. *Style* of the disk with long arms, covered by down running a long way down, and truncated or terminated by a short cone. *Achænium* somewhat cylindrical, tapering to each end, somewhat ribbed and hairy. *Pappus* in one row, composed of close, rigid, rough hairs. (*De Candolle. Lindley.*)

Specif. Char.—A perennial hairy plant a foot high. *Leaves* entire, opposite; the radical obovate, or oblong, five-nerved; the cauline in one or two pairs; they are hairy and whitish. *Stem* 1—3 headed. *Heads* erect or drooping. *Involucres* rough with glands. *Flowers* deep yellow.

This plant is an inhabitant of the south of Europe, growing in elevated positions in the Alps and Pyrenees. It is said to advance as high as the perpetual snow line.

The root consists of a cylindrical caudex, two or three inches long, with many fibres. The flowers are in loose heads with much pappus. Both are used in medicine. They have a disagreeable aromatic odour, and an acrid nause-

ous taste. They owe their properties to a volatile oil, acrid resin and extractive. The bitter acrid principle found in the flowers by Chevallier and Lassaigne has been called *cytisin*. The resin by Pfaff has been called *arnicin*. These two may have been confounded.

Arnica is an acrid stimulant; it produces an acrid sensation in the throat, nausea, vomiting and gastric disturbance, quickening the pulse, and acting on the secretions. It also acts upon the brain, inducing vertigo, dizziness, headache, &c. It is used in nervous diseases. Of late it has come again somewhat into use, and is given in powder or infusion.

PLATE L.—*Represents the plant in flower, and the enlarged organs of reproduction.*

# LOBELIACEÆ.

## JUSSIEU.

## LOBELIADS.

ESSENTIAL CHAR.—Herbaceous plants, or shrubs, with milky juice. *Leaves* alternate, without stipules. *Flowers* axillary or terminal. *Calyx* superior, five-lobed or entire. *Corolla* monopetalous, in æstivation valvate, irregular, inserted in the calyx, five-lobed, or deeply five-cleft. *Stamens* five, inserted into the calyx alternately with the lobes of the corolla; *anthers* cohering; *pollen* oval. *Ovary* inferior, with from one to three cells. *Ovules* very numerous, either attached to the axis, or parietal. *Style* simple. *Stigma* surrounded by a cup-like fringe. *Fruit* capsular, one or more celled, many seeded, dehiscing at the apex. *Seeds* attached either to the lining or the axis of the pericarp. *Embryo* straight in the axis of a fleshy albumen; *radicle* longer than the cotyledons, pointing to the hylum.

Many of this family have a milk-like juice which is acrid and poisonous. In the one which is most active in this country, a peculiar alkaloid principle exists. They inhabit, it appears, every continent but Europe.

# LOBELIA INFLATA.

## LINNÆUS.

## INDIAN TOBACCO.

SEX. SYST.—Pentandria, Monogynia.

GEN. CHAR.—*Calyx* five lobed, tube obconical, ovoid or hemispherical. *Corolla* cleft longitudinally from above, bilabiate, the tube cylindrical or funnel-shaped, straight; the upper lip usually smaller, and erect; the lower generally spreading, broader, three-cleft, or more rarely three-toothed. The two inferior, or occasionally all of the anthers, barbed at the point. *Ovary* inferior or semi-superior and (in species very much alike) somewhat free. (*De Candolle.*)

SPECIF. CHAR.—Height from six inches to two feet. The small plants simple, the larger much branched. *Root* fibrous, annual or perennial according to location. *Stem* erect angular, ciliated by the decurrence of the leaves, hairy; branches axillary. *Leaves* one to two or three inches long, half to an inch wide, sessile ovate, rather acute, unequally crenate, sinnate dentate and pilose. Spikes or racemes peduncled, in the axils of the leaves. *Segments* of the calyx subulate. *Corolla* pale blue, tube prismatic and cleft above, the segments spreading, acute, the two upper lanceolate, the three lower ones oval. *Anthers* collected into an oblong curved body. *Style* filiform. *Stigma* curved and closed by the anthers. *Ovary* oblong, striated. *Capsule* two-celled, turgid oval, thin and membranous, ten-angled, reticulately veined, crowned with the calyx. *Seeds* numerous, small oblong, brown, with reticulated ridges under a lens.

This species of Lobelia is a North American plant; it is found over the United States from the Lakes to Carolina, and westward to the Mississippi. It flowers in July and August, and continues to flower late in the autumn, ripening its fruit successively. The herbaceous portion is collected for medicinal use in August. It is abundant through the Middle states by the road side, but is principally derived from the Shaker establishment at New Lebanon. The fresh plant when bruised exhales a disagreeable odour, and has an acrid taste. When collected, dried carefully and preserved in bundles, it has a fresh appearance and preserves its odour and taste. When packed in square forms as

LOBELIA INFLATA.

ARCTOSTAPHYLOS UVA URSI.

is practised by the Shakers, it is apt to become mouldy and change its fresh appearance. In sensible properties it to a certain extent resembles tobacco; hence the common appellation Indian tobacco. This is also maintained in its medical properties.

*Lobelia* inflata was supposed to contain a peculiar principle by the late Dr. S. Calhoun, but he did not follow up his investigations,—and it was not critically analyzed until taken in hand by Prof. Procter in 1837. From the experiments of this gentleman it appears that it contains gum, gallic acid, volatile oil, greenish resin, or chlorophylle, a green fixed oily matter, *a peculiar alkaline acrid principle*, salts and lignin. The peculiar principle resembles that in tobacco; to this Prof. Procter gave the name *Lobelina*. (See paper in *Journ. of Pharm.*, vol. ix.) Pereira states that an acid (*lobelic*) is also a constituent; this has been admitted and examined in a subsequent paper by Prof. Procter (*Op. Cit.*, vol. xiii). In the seeds a fixed oil exists.

The medical properties of this drug are those of an emetic, with complete relaxation, excessive nausea and vomiting, and promotion of all the secretions. In over doses death has been the consequence. Notice was first directed to it from the trial of a charlatan, Samuel Thomson, who was accused of poisoning an inhabitant of Beverly by it. Under cautious use it is a valuable remedy in asthma and pulmonary affections.

It yields its properties to water and alcohol, which are more highly surcharged with the active principle, if an acid, as acetic, be added. An infusion, tincture, and syrup have been prepared from it.

PLATE LI.—*Represents the plant in flower, the dissected flower, and fruit.*

# ERICACEÆ.

## DE CANDOLLE. LINDLEY.

## HEATH TRIBE.

ESSENTIAL CHAR.—*Calyx* four or five partite, almost equal, inferior, persistent. *Corolla* hypogynous, monopetalous, 4–5 cleft, occasionally separable into four or five pieces, regular or irregular, often withering, with an imbricate æstivation. *Stamens* definite,—equal in number to the segments of the corolla, or twice as many, hypogynous, or scarcely inserted into the base of the corolla; *anthers* two-celled, the cells hard and dry, separate either at the apex or base, where they are furnished with some kind of an appendix, and dehiscing by a pore. *Ovary* surrounded at the base by a disk, or secreting scales; many-celled, many-seeded. *Style* one, straight. *Stigma* one, undivided or toothed, or three-cleft, with an indication of an indusium. *Fruit* capsular, many-celled, with central placentæ, dehiscence varies. *Seeds* indefinite, minute, testa firmly adhering to the kernel. *Embryo* cylindrical, in the axis of the fleshy albumen; *radicle* much longer than the cotyledons and next the hylum. (*Lindley.*)

The plants composing this class are among the most delicate and beautiful. They are shrubs or under shrubs. Leaves evergreen, rigid, entire, whorled, or opposite, without stipules. The inflorescence is variable, the pedicels generally bracteate. The medical properties are astringent, tonic and diuretic. Some of them are characterized by the presence of prussic acid, as the species of Rhododendron and Kalmia.

# ARCTOSTAPHYLOS UVA URSI.

## SPRENGEL.

## BEARBERRY.

ARBUTUS UVA URSI.—*Linnæus.*

SEX. SYST.—Decandria Monogynia.

GEN. CHAR.—*Calyx* five partite. *Corolla* ovate urceolate; the mouth five-toothed, revolate short. *Stamens* ten, enclosed. *Filaments* somewhat dilated at the base, hairy-ciliate. *Anthers* compressed with two pores at the point, laterally two-armed, arms reflexed. *Ovarium* globose, depressed, surrounded with three scales. *Style* short. *Stigma* obtuse. *Berry* (or berried drupe) globose, five, rarely six, seven, or ten-celled. *Cells* one-seeded. (*De Candolle.*)

Specif. Char.—*Stem* woody, trailing and rooting, the young shoots only turning upwards. *Bark* deciduous, and peeling off from the old stems. *Leaves* alternate, obovate, acute at base, attached by short petioles, coriaceous, evergreen, glabrous, shining above, paler beneath, entire, and in the young ones pubescent, the margin rounded, but scarcely reflexed. *Flowers* terminal, clustered. *Pedicels* reflexed, furnished at the base with a short acute bract, and two minute ones at the sides. *Sepals* five, roundish, reddish, and persistent. *Corolla* ovate or urceolate, white with a reddish tinge, transparent at base, contracted at the mouth, hairy inside, with five short reflexed segments. *Stamens* very slightly adhering to the base of the corolla. *Filaments* hairy. *Anthers* each with two horns and two pores. *Ovary* round. *Style* straight, longer than the stamens. *Stigma* simple. *Disk* a black indented ring. *Fruit* succulent, globular, depressed, deep red, approaching scarlet, with an insipid mealy pulp, and five seeds, which cohere strongly together, so as to appear like the nucleus of a drupe. (*Lindley.*)

The *Bearberry* is found in Northern Europe, Asia, and in America. It grows in the United States in barren soil like heather. In New Jersey it is abundant. It flowers in May and June.

The leaves constitute the officinal portion; in the dried state they are smooth, shining and pale green, reticulated beneath. They have an astringent taste, and a very slight odour. The leaves of the *Box* (Buxus sempervirens) and of the *red whortleberry* (Vaccinium vitis idea) are sometimes mixed with them.

According to Meissner they contain *tannin* and gallic acids, resin, oxidized extractive and salts.

The medical properties are those of an astringent and diuretic, useful in cases of chronic mucous affections of the bladder. As a solvent for stone the article had some reputation, but the beneficial effects in lithiatic disease are merely alterative.

Plate LII.—*Represents the plant in flower, the dissected flower, and fruit.*

# PYROLASEÆ.

## LINDLEY.

## WINTER GREEN TRIBE.

Essential Char.—*Calyx* free, four, more frequently five, partite, persistent. *Petals* five, free or cohering, perigynous, with an imbricated æstivation. *Stamens* twice the number of the petals, to which they are not adherent. *Anthers* bilocular, dehiscing by two pores. *Ovarium* three to five-celled, seated on a hypogynous disk. *Style* one. *Stigma* roundish or lobed, sometimes slightly indusiate. *Capsule* three to five-celled, three to five-valved, loculucidal, dehiscent. *Placentæ* adherent at the centre. *Seeds* indefinite, minute, with a pellicle indusiate or winged. *Embryo* minute at the base of fleshy albumen, with moderately distinct cotyledons. (*De Candolle.*)

This tribe is composed of herbs the natives of North Europe, Asia and America. They have been separated from Ericaceæ by Lindley, but have somewhat similar medical properties.

# CHIMAPHILA UMBELLATA.

## NUTTALL.

## PIPSISSEWA.

Pyrola Umbellata.—*Linnæus.* Chimaphila Corymbosa.—*Pursh.*

Sex. Syst.—Decandria Monogynia.

Gen. Char.—*Calyx* five-cleft. *Petals* five, spreading, deciduous. *Stamens* ten; two in front of each petal. *Filaments* dilated in the middle. *Ovarium* rounded, obconical, obtusely angular, umbilicated at the apex. *Style* very short, concealed in the umbilicus of the ovary. *Stigma* orbicular, tuberculated, five-crenate. *Cells* of the capsule dehiscent at the apex; the valves not connected by tomentum. (*De Candolle.*)

Specif. Char.—*Rhizoma* woody, creeping. *Stems* ascending, somewhat angular, and marked with the scars of

CHIMAPHILA UMBELLATA.

former years. *Leaves* in irregular whorls, of which there are from one to four; evergreen, coriaceous, on very short petioles, cuneate-lanceolate, acute, serrate, smooth, shining, the lower surface somewhat paler. *Flowers* nodding in a small corymb, the pedicels with linear bracts about their middle. *Calyx* of five roundish acute teeth or segments, much shorter than the corolla. *Petals* five, roundish, concave, spreading, cream-coloured, with a tinge of purple at base. *Stamens* ten, hypogynous. *Filaments* sigmoid, the lower half fleshy, triangular, dilated, and slightly pubescent at the edges; the upper half filiform. *Anthers* two-celled, each cell opening by a short round tubular orifice, which points downwards in the bud, but upwards in the flower. *Pollen* white. *Ovary* roundish, depressed, furrowed obscurely, five-lobed, with a funnel-shaped cavity at top. *Style* straight, half as long as the ovary, inversely conical, inserted in the cavity of the ovary and concealed by the stigma. *Stigma* large, peltate, convex, obscurely five-rayed. *Capsule* erect, depressed, five-celled, five-valved, the partitions from the middle of the valves. *Seeds* linear, chaffy, very numerous and minute. *Leaves* bitter sweet, stalk and roots the same, with a little pungency. (*Lindley.*)

This plant inhabits North America, Siberia and Europe. It is found abundantly in the North and Middle States of this country, in open sandy woods, and flowers in July.

The officinal portion is the leaves, but it is usually brought into the market entire. When fresh the herb has a peculiar odour and a bitter astringent taste, which are retained in the dried state. In the latter condition the freshness ought to be retained. *Pipsisseva* or, as it is sometimes called, *Wintergreen,* contains *bitter extractive, resin, tannin,* and the usual principles.

The medicinal effects are those of a tonic, depurative and diuretic. It is used in scrofula, atonic dropsy, and in chronic mucous affections of the urinary organs. It is given in decoction, infusion and syrup, or extract.

PLATE LIII.—*Represents the plant in flower, and the fruit.*

END OF VOLUME I.